

Norwood's Epitomy:

BEING THE

APPLICATION

O. F.

The Doctrine of TRIANGLES

In certain Problems, concerning the use of
the Plain Sea-charts, and Mercators Chart.

Being the two most usual kinds of Sailing.

With a Table of Artificial Sines, Tan-
gents, and the Complements Arithmetical
of Sines supplying the use of Secants.

To Radii 10,00000, and to every Degree
and Minute of the Quadrant.

ALSO

A Chiliad, or the Logarithms of absolute Num-
bers, from a Unity to 1000, with a Table of the Right
Ascension and Declination of the Sun: and cer-
tain principal Stars that are most in use.

Whereunto is added the farther use of the fore-
named Tables in Questions that concern Naviga-
tion, Astronomy, and Geography. As also an
Universal Almanack.

By Richard Norwood, Reader of the
MATHEMATICKS.

L O N D O N.

Printed by W. G. for G. Harlock, and are to
be sold at his shop at St. Magnus Church,
near London-Bridg. 1667.

22

530.α.γ
—
1-2

1667: R. & J. Hooke. prnt. 18°. M. 11. 11. 11.

Norwood's Epitomy:

BEING THE
APPLICATION /
O. F

The Doctrine of TRIANGLES

In certain *Problems*, concerning the use of
the Plain Sea-Charts, and Mercator's Chart.

Being the two most usual kinds of Sailing.

With a Table of Artificial Sines, Tan-
gents, and the Complements Arithmetical
of Sines supplying the use of Secants.

To Radius 10,00000, and to every Degree
and Minute of the Quadrant.

ALSO

A Chiliad, or the Logarithms of absolute Num-
bers, from a Unity to 1000, with a Table of the Right
Ascension and Declination of the Sun: and cer-
tain principal Stars that are most in use.

Whereunto is added the farther use of the fore-
named Tables in Questions that concern Naviga-
tion, Astronomy, and Geography. As also an
Universal Almanack.

By Richard Norwood, Reader of the
MATHEMATICKS.

L O N D O N.

Printed by W. G. for G. Hartlock, and are to
be sold at his shop at St. Magnus Church,
near London-Bridg. 1667.

22

APPLICATIO



696

THE BRITISH MUSEUM.



Norwood's Epitomie.

Being the Application of the Doctrine of Triangles, in the two principal kinds of Sailing.

MY intent was here to have annexed a Treatise of Navigation, and especially of such points therein, as have reference to the whole Doctrine of plain and Spherical Triangles; But I have here shewed the resolution of all useful Problems, touching the two principal kinds of sailing by right-lined Triangles.

Questions of sailing by the plain or ordinary Sea-Chart.

Although the ground of the Projection of the ordinary Sea-Chart being false (as supposing the Earth and Sea to be plain Superficies) and so the conclusions thence derived must also for the most part be erroneous; yet because it is most easie, and much used, and the errors in small distances not so evident, we will not wholly neglect it.

Quest. 1.

Sailing 100 Leagues upon the sixth Rumb, how much shall I alter my Parallel or Latitude?

Note. The angle that any point of the Compass makes with the Meridian, we call the Rumb: but the angle that it makes with any Parallel, we call the complement of the Rumb.

And forasmuch as to every point of the compass there answers 1 deg. 15 min. therefore the sixth Rumb from the Meridian (namely, ENE, ESE WNW, or WSW) answers an-

Problems of Sailing.

gle therewith of 67 deg 36 min. whose complement 22 deg. 30 min. is the angle of the same Rumb with every Parallel.

Now admit I sail from D to A Northeast 100 leagues. I demand the difference of Latitude B D.

By the third Case of plain Triangles.

As Radius

To the distance run,	A D 100 leagues,	2,00000
So sine complem. the Rumb.	$\therefore A 22 \text{ deg. } 30 \text{ min.}$	9.58284
To the difference of Latitude, D B	$38 \frac{1}{2} \text{ leagues,}$	7.958284

In like manner you may find the difference of Latitude, for any distance run upon any other point of the Compas.

2. Sailing 100 leagues upon the sixth Rumb, How far am I deparced from the Meridian of the place from which I came?

That is by the same things given as before, I demand A B.

By the third Case of plain Triangles.

As Radius

To the distance run,	A D 100 leagues,	2,00000
So is the sine of the Rumb,	$\therefore D 67 \text{ deg. } 30 \text{ min.}$	9.96562
To the departure from the Merid. A B 92 $\frac{3}{4}$ leagues.	1.96562	10

3. Sailing upon the sixth Rumb, till I alter my Latitude one degree, I demand how far I have sailed?

Assailing from D to A, East Northeast, till the difference of Latitude D B be 10 leagues, I demand the distance run A D.

By the second Case of plain Triangles.

As sine complem. the rumb,	$\therefore A 22 \text{ d. } 30 \text{ min. } 0. \text{ ar.}$	0.41716
To the difference of Latitude D B 10 leagues,	1,30703	10
So is Radius		
To the distance run A D 52 $\frac{3}{4}$ leagues,	3.71819	10

The like question might be moved, by the departure from the Meridian given.

A

4. Sailing



by the plain Sea-Chart.

3.

4. Sailing upon the sixth Rumb, till I have altered my Latitude one degree; how much am I departed from my first Meridian?

As sailing from D to A, East Northeast, till the difference of Latitude D B be 10 leagues, I demand A B, my departure from the Meridian, (as for example in the former type.)

By the first Case of plain Triangles.

As Radius

To the difference of Latitude, D B, 10 leagues. 1,30103
So is the tangent of the rumb. / D 67 deg. 30 min 10,38278
To the departure from the Merid. A B 48 $\frac{3}{10}$ leagues, 1,68381

In like manner by the departure from the Meridian given, you might find the difference of Latitude.

5. Sailing upon some Rumb, between the North and the East 52 $\frac{3}{10}$ leagues, and finding that I have altered my

10

Latitude one degree: I demand upon what point I have sailed?

As if I sail from D to A, (being some Rumb between the East and North) 52 $\frac{3}{10}$ leagues; and then find the difference of

Latitude D B to be 10 leagues; I demand the angle A D B.

Say by the first Case.

As the Distance run. D A 52 $\frac{3}{10}$ leagues, &c. 8,18192

Is to Radius:

So is the difference of Latitude D B 10 leagues, 1,30103
To find complement the Rumb. / A. 22 deg. 30 min 9,58294

Whose complement D. 67 deg. 30 min. is the sixth point from the Meridian, namely, East Northeast. Here we neglect some part of a minute (as in these things not to be regarded) and so in other places

6. Sailing upon some Rumb between the North and the East, 52 $\frac{3}{10}$ leagues, and finding that I have altered my

10

Latitude one degree: I would know my departure from my first meridian.

A 3

By

2

Problems of Sailing

By the seventh Case.

To the distance run, add the difference of Latitude, and also subtract it from the said Distance, noting the Sum and Remainder. Then add together the Logarithms of this Sum and Remainder, and half that Total is the Logarithm of the distance from the first Meridian.

Distance run D A , y_2 $\frac{3}{10}$ leg. Summ y_2 $\frac{3}{10}$ leg. 1,25884.

Differ. of latid. DD , 10 leag. $\frac{3}{5}$ Remain. 32 $\frac{1}{2}$ leag. = 1.56863

Departure from the Meridian 12.48 3 Leagues. 3.6737

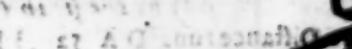
The same may be otherwise found by the same cause.

And in like sort might the difference of latitude be found, the departure from the Meridian being known.

7. The distance of the Meridians of two places, and
the difference of the Latitudes of the same places
being given, to find the Rumb and distance.

As let A represent the Lizard in the West part of England, and A B the Parallel thereof, and let D represent St. Maria's Island being one of the Azores, D B the Meridian thereof.

Then is A B the distance of the Lizard from the Meridian of St. Maria; which let be 222 leagues; and A B the distance of their parallels, or difference of their latitudes 258 leagues, I demand the Rumb, namely, the angle at D, and the distance in the Rumb A D.

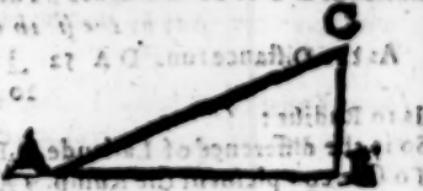


First for the rumb, say by the fourth case.

As the difference of Latitude. DB 236 leagues, or 37.7, 19176
Is in proportion to Radius:

So is the distance of the Meridian A B, 272 leagues, 2,43457

To the tangent of the zumb: D, 46 deg. 44 min. 10.02633
Which is the fourth Rumb from the Meridian, and a degree
44 min. more; which shews the course from St. Maries to the



Lizard to be Northeast, 1 degree 44 min. Easterly: or from the Lizard to St. Marys Southwest, 1 deg. 44 min. Westerly. And thus it should be by the plain Chart.

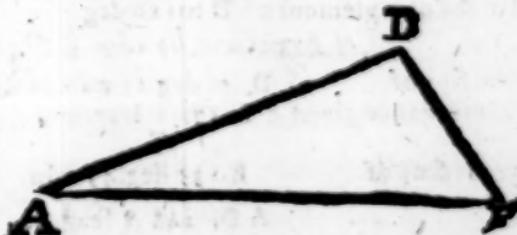
Secondly, for the distance A D, say by the 2 case. As the sine of the Rumb, s D 46 deg. 44 minutes, $\text{co. ar. } 0,13776$ To the distance of the Meridians A B, 272 leagues. $2,43457$ So is the Radius.

To the distance of the places A D, $373 \frac{1}{2}$ leagues, $2,57233$

And such should be the distance by the plain Chart.

8. Sailing away W SW, I see a point of Land, which I set, and find to bear from me West by North, and having sailed six leagues further, I find it bears from me Northwest by West: I would know how far it is distant.

As let E be a point of land, which when the ship is at A, I set and find to bear from West by North, but I hold on my course from A to D



West South West 18 miles, and at D, I set the same point of Land again, and find it to bear from me Northwest by West: I demand the distance thereof D E, that is, how far it was from me in my last observation?

First, I consider between A E, the West by North, and A D the West South west, is three Points of the Compass, that is, 32 degrees 45 min. which is the angle at A: also between E A, the East by South, and E D the South-east by East are two Points, that is, 22 degrees 30 minutes.

Therefore by the 8th. Case of plain Triangles.

As sine the angle at the point seen, s E 21 d. 30 m. co. ar. $0,41716$
Is to the distance run, $A D 18$ miles, $1,25327$

So sine the angle at the first place of observation, $A 33$ degrees 45 min. $0,74474$

To the distance of the point seen, $E D 26 \frac{1}{10}$ miles, $1,41774$

Whereby it appears, that the distance of the point seen from the place of your last observation is 26 miles, and a furlong. In like manner you may find the distance thereof from the place of your first observation A.

Admit the course from the Lizard to S. Maries be S W the distance $373 \frac{1}{2}$ leagues. A certain ship bound from the Lizard to S. Maries, steers away SSW, and afterwards W by S, and so sometimes upon one of those points, sometimes upon the other, till she arrives at S. Maries; now I demand how many leagues she hath sayled upon one of these points, and how many upon the other?

Let A be the Lizard, E. S. Maries, and seeing SSW, being from Southwest two points, makes an angle therewith of 22 deg. 30 min. which let be A; Also West by South makes with SW an Angle of 33 deg. 45 min. which let be E, also South SW, makes with West by South an angle of 36 deg. 15 min. which let be the complement of D to 180 deg.

I herefore by the 8 Case.

As the sine of	D, 56 deg. 15 min. com. an.	0.8015
To the distance given A E, $373 \frac{1}{2}$ leagues,		2,55113
So is the sine of	E, 33 deg. 45 min.	7,74774
To	A D, $148 \frac{9}{10}$ leagues,	2,19602

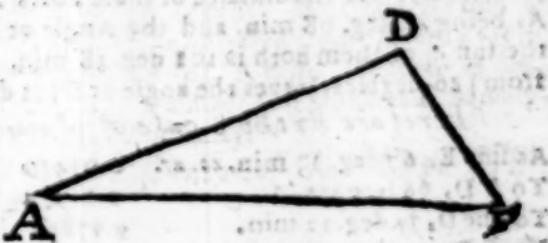
Which is the distance run upon the West by South points.

As the sine of	D, 56 deg. 15 min. com. an.	0.8015
To the distance given A E, $373 \frac{1}{2}$ leagues		2,55113
So is the sine of	A, 2 deg. 30 min.	0.58234
To the way run	E D, $171 \frac{44}{100}$ leagues,	2,235412

Which is the distance run upon the West by South points.
IO. A Merchant-man, being in the Latitude of 43 degrees, falls into the hands of Pirates, who amongst other things take away his Sea-compass. But when he is gotten clear, he sails away as directly

reelly as he can, and after two days meets with a Man of War, who also had been the day before in the Latitude of 43 deg. and had sailed thence S E by S 37 leagues. He desirous to find those Pirates, the Merchant-man tells them, he left them lying so and fro where they took him, and he had sailed since at least 64 leagues, between the South and west: what course shall the Man of War shape to find these Pirates?

Let A E be the Parallel of 43 deg. D the place where the ships meet: then is there given A D 64 leagues, E D 37 leagues, and the angle D E A five points or 56 deg. 15 min.



Therefore by the 9 Case of plain triangles.

As the distance run by A D 64 leagues, &c. 47.

8,19,82

the Merchant man, To sine the angle given, S E, 56 deg. 15 min.

9,91,983

So is the distance runn E D, 37 leagues.
by the Man of War

1,16,820

To sine an angle required, S A, 23 deg. 44 min.

9,68,187

This is VWest Southwest, 6 deg 14 min Southerly, and so bath the Merchant sailed; therefore to return to the same place he must shape his course East Northeast, 6 deg 14 min. Northerly.

11. There are two Ports lying N E, and N W, one off another, a ship sails from the Westermost of these Ports East Southeast 47 leagues, another departing from the Eastermost Port sails 66 leagues, and then meets with the former, what course hath this second ship kept; and how far are these Ports asunder?

Let

Let the Northeast Port be A, the Southeast E, and the place where these Ships meet at D. And forasmuch as from E to A, the course is Northeast, and from E to D East Southeast, therefore the angle at E, is 67 degrees 30 min. and the side E D, 47 leagues, and A D 66 leagues.

Therefore by the 9 case of plain triangles.

As A D 66 leagues, co. ar. 2,13046 E, the course is South To sine E, 67 deg. 30 min. 9,96361 West, and from A to D So E D 47 leagues 1,67210 41 d. 08 m. more South To sine A, 41 deg. 08 min. 9,81817 therly: therefore the course from A to D, is South 3 deg. 52 min. Westerly.

Secondly, for the distance of these Ports A E, the Angle at A, being 41 deg. 08 min. and the Angle at E 67 deg. 30 min. the sum of them both is 108 deg. 38 min. which subtracted from 180 degrees, leaves the angle at D, 71 deg. 22 min.

Therefore by the 8 case of plain triangles.

As sine E, 67 deg. 30 min. co. ar. 0,03439	So that the di-
To A D, 66 leagues. 1,67210	stance between
To sine D, 71 deg. 22 min. 9,97662	the two Ports is
To A E, 67 2 leagues, 1,83055	67 2 leagues.

10

Some may think it requisite, that the latter part of this Problem should have been a distinct case in plain Triangles; but because the same things are here given as in the 9 Case, and the operation manifest by the Eighth and Ninth, I thought it not necessary to make another Case of it.

12. *Coasting along towards the evening, I have sight of a Cape or Headland, beyond which I desire to steer in, the next morning it bears from me SSE, and is distant by estimation 11 leagues, but I steer away South till two of the clock in the morning about 12 leagues; and then would know how the Cape bears from me, & how far it is off.*

At admit A, I observe the Cape D to bear from the South Southeast 11 leagues; but I steer away South, to E 12 leagues. I have then A D 11 leagues. A E 12 leagues, the angle at A 22 deg. 30 min (as for example) in the foregoing type.

First,

First, then for the angle at E, by the 12 Case.

To $\angle E - \angle D + \angle A$ 23 leagues, com. ar. 8,03828.

To $\angle E - \angle D$, or 1 league. 9,33963.

So $\frac{1}{2} + D$ 178 degrees 45 minutes. 10,76114

To tang. an angle F, 11 degrees 20 minutes. 9,33963

Which subtracted $\angle E$, 66 degrees 25 min. there remains 3

In working this example: because the angle given $\angle A$, is 23 deg 30 min. therefore the other two $\angle B$ and $\angle D$, are 157 deg. 30 min (by the first Lemma of the third Chapter of plain triangles) the half whereof is 78 deg. 45 min. Whereby we find an angle F, 11 deg. 20 min. which subtracted from 78 deg. 45 min. there remains the angle at E, 66 deg. 25 min. Wherefore seeing $\angle E A$ is a North line, $\angle E D$ is almost East Northeast, namely, East Northeast 1 deg. 5 min. Northly.

Secondly, for the distance of the Cape ED, by the 8 Case.

A sine the angle found, 1 E 66 d. 25 m. 29. ar. 0,03782

To the distance in the evening 1 A D 11 leagues : 1,04139

So the sine of the angle given, 1 A 23 d. 30 min. 9,50284

To the distance in the morning. E D 4 6 leagues. 066215

10

That is above 4 leagues and a half distant.

13. Admit I sail away from a certain Port SSW 50 leagues, and thence again W by S 30 leagues, upon what point have I made my way good, and how far am I come from Port?

As admit still from A to D South Southwest 50 leagues, and from D to E, West by South 30 leagues. there is required the course A, or E, and A E.

From the South Southwest to the West by South are 5 points, that is 56 deg. 15 min. which is the complement of the angle at D, to 180 deg. So that the angle at D is 123 deg. 45 min. Wherefore here are given the two sides A D, and E D, and their contained angle at D; Therefore

As A D + ED, 80 leagues.	or. ar.	8,09691
To A D - ED 30 leagues,		3,39103
So ± 1 (A + E) + 23 degrees 08 min.		9,72310

To	1 F. 07 degrees, 37 min.	10,81004
----	--------------------------	----------

V which subtracted	3 A 20 degrees 31 min.	
--------------------	------------------------	--

V wherefore seeing the course from A to D, is South Southwest, the course from A to E, is 20 degrees 31 min more Westerly, that is Southwest, 2 deg. Southerly; so that I have made my way good Southwest two degrees Southerly.

Secondly, for the distance upon that Point.

As sine the angle sound, 3 A 20 degrees 31 min. or ar. 0,45534

To his opposite side given, ED, 30 leagues. 3,47712

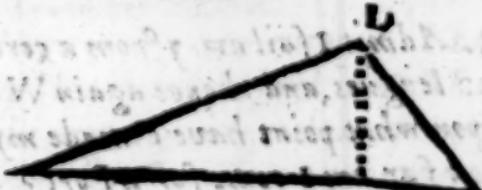
So sine the angle given, 3 D, 36 degrees 15 min. 9,91983

To his opposite side required, AE, 71 $\frac{1}{2}$ leagues, 1,85131

Which is the distance from that Port.

14. There are two Ports in one land the same Parallel, or Latitude, distant 64 leagues, and there is a certain Island more Southerly, distant from the Easternmost of these Ports 47 leagues, and from the Westernmost of them 34 leagues: I demand the course from the Easternmost Port to that Island?

Let the Easternmost port be A
the Westernmost E, both in one
and the same Parallel AE, distant
64 leagues, and let the Island be
D, distant from
A 47 leagues, and from E 34 leagues; there is required, the
course from A to D, that is the angle at A, or the complement
thereof.



By the 12 case of plain Triangles.

As the distance of the parts A E, 64 leagues. or ar. 8,19394
To

the sum of A D, and E D, 21 leagues,	1,968 48
is the difference of A D, and E D, 13 leagues,	1,113 4
to a certain line A, 16 454	1,316 24
which is added to A E, is 80 454	
which is added to A B, 40 227	1,000
The half whereof is	

Then by the 6 case of plain triangles.

As A D 47 leagues,	compl. ansh.	8,32,790
o Radius ;		
o A B, 40 227		1,60,453
1000		

osc A, 58 degrees 51 min. 9,932 42
That is Southwest and by West, 2 deg 36 min. Westerly,
which is the course from the Easternmost port to the Island.

5. A ship sails from one Port to a second SSE 76 leagues, and from thence to a third 54 leagues, and from that third to the first 8 1/2 leagues. I demand the course from the second Port to the third, and from the third to the first?

This and the like are to be wrought as the former, which therefore we leave to your own practice.

Of Sayling by Mercators Chart.

And thus much of the plain Chart, which as it hath this commodity, that it is most easie; so it hath some discommodity intollerable. For there be very few places that can certein be expressed, according to the true Situation and distance one from another. Which as it is a great impediment in the practice of Navigation, so it hath caused much confusione in the Geographical, and Hydrographical descriptions of places; insomuch as there are scarce extant any Descriptions of the World or the parts thereof, that are not pestered with notorious Errours; the greatest part of them hence arising. It is indeed ancient, and till the Sea Compas was known. It was the first Chart that could be used; because till then, men were

were Coasters, and for the most part returned back the same way they went forth, and it may still serve without any great Error in such places as are near the Equinoctial, also in many other places for short Voyages, and even for long Voyages, provided that a man be sure to return the same way that he went, or near the same. Otherwise, if he trust to the plain Chart, he will be most grossly deceived many times in his course a point or two of his Compass, and in his Distance many hundred miles. But in this Sea-Chart called *Mercator* all or any parts of the World may be set down, according to their Longitudes, Latitudes, Courses and Distances, as truly and far more conveniently for the Mariners use, than upon the Globe it self: So that it will truly shew the direction and distance from place to place, which way soever a man goes or returns.

Some men will say, that in divers reckonings by *Mercator* Chart, they have found as little certainty, as by the plain Chart. Which I deny not, but the reason is, because there are few or no Charts made directly according to this Projection. It will be said, Yes, there be many; and that a man may have of them whensoever he will bespeak them. I grant a man may have those which are so called, but that which is such indeed, must not only have the Meridians, Parallels, and Rumb drawn according to this Projection; but the Sea-coasts must be inserted by the like Art and means as they have formerly been inserted into the common Sea-Chart: otherwise, he shall transfer places out of the common Sea Chart into *Mercator*, without due knowledge and respect upon what occasion or for what reason they were so placed in the common Sea-Chart; he shall transfer the Errors of the one into the other. And that sometimes with increase. Wherfore it requires more then an ordinary judgment, to draw a Plot directly according to this Projection, for any place or places; and he must further know, or be made acquainted with the reckoning of Mariners frequenting those places; and that truly whether with allowance or without, and whether agreeing or disagreeing with their plots, and so comparing one thing with another, and weighing all in the balance of a good judgment, he shall be able to do it. The ground of the Projection of this kind of Charts was pointed at by *Tuleny*, many hundred years since; and according to that ground, *Mercator* did a late years set forth an universal Map of the World; where

same on these have been called *Mercators Charts*. But the way
to greatest to describe them was first taught by that learned Naviga-
tor in our of our times, Mr. Edward Wright, in his Book of the Cor-
; Voyage of Errors in Navigation. From whence also the grounds
e were and reasons of these ensuing Problems are to be taken: and
to the we would be as grateful to our own Country-men as to
ones in strangers, I see not but we may ascribe as much to him in
istance as, as to any other man. Now that which he hath shewed
; perform by the Chart it self, we will here shew to work by
ing to the Doctrine of plain Triangles, using the help of the Table
ly and Logarithm Tangents, beginning at 45 degrees 00 minutes, and
on the increasing upwards, accounting every 30 min. to be one
a and deg of the Meridian line, as the Tangent of 45 degrees
sea of 100 min. to be one deg. of the Meridian line, the Tangent of 46
g. 00 min. to be two deg. 00 minutes of the Meridian line,
and so forwards, so that every minute is two minutes of the
plain Meridian line; and although that these be not the same Meri-
dional parts that are in the Doctrine of Triangles, yet they
occed in the same proportion as the Secants added together
have, and shall produce the same solution to every Problem
a man Sailing by *Mercators Chart*, as the other Tables do; but be-
cause in this small Volume we have but one Chilaid of 1000
Lumber logarithmes, I shall work by Leagues, and not by miles, or mi-
nutes; yet I shall resolve the same Problems of Sailing by *Merc-
ators Chart*, that are set down in the Doctrine of Triangles.

rob. 1. *To find by these Tables what Meridional
leagues are contained in any difference of latitude.*

To perform this Problem, we must take half of each of the
given Latitudes, and to each half add 45 degrees 00 min.
and the Sum shall shew us the degrees and minutes, where we
and he shall find the Tangent to give us the Meridional leagues from
the Equinoctial to each latitude, but it shall suffice us to subtract
the lesser tangent out of the greater, and to multiply the dif-
ference or remainder by 10, and to divide that Product by
1000, and the quotient shall be the meridional leagues contain-
nt. half between the two Latitudes.

As Let one Latitude be 50 deg. 00 min. the other 75 deg. 35
min. The half of 50 deg. 00 min. is 25 deg. 00 min, to which
did add 45. deg. 00 min. the Sum is 70 d. 00 min. which are 45000.
The half of 75 deg. 35. min. is 37 deg. 17 min. and an half
spoon

to which add 45 deg. 00 min. the sum is 61 deg. 17 min.

where we must look the equal parts, viz. at the Tangent 61 deg. 17 min and a half, which are 26147. Which subtract from 4893, and the remainder is 17746, which multiplied by 10, is 177460, and that divided by 376, the quotient is 47 leagues nearest, which are the meridional leagues contained between the two Latitudes, and the like is to be done for all Latitudes whatsoever.

Now although this way doth a little differ from that we done by Meridional parts; yet the difference is of no validity to breed any considerable error in the course, and so by consequence not in the distance; and therefore I desire a favourable construction of it.

Prob 2. The Latitudes, and difference of Longitude of two places given; to find the sum and distance?

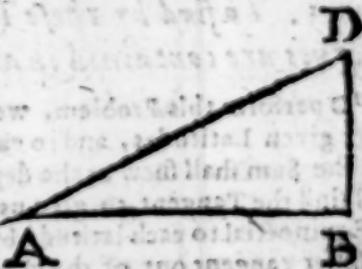
To the intent the application may be the more evident, we will give examples of two places expressed in the Chart.

As admit the Latitude of the Lizard to be 30 deg. 00 min. the Latitude of Summer Islands, sometimes call'd the Bermudas; 2 deg 25 min. and the difference of Longitude to be 70 deg. 00 m. the Summer-Islands being so much to the Westward of the Lizard. I demand the course, & the distance from the one to the other.

As in this right ang'd Triangle ADB. Let A represent the Lizard and A B the Parallel thereof, D Summer-Islands, and DB the Meridian thereof.

Then is there given DB the difference of Latitude 17 d. 35 min. and AB the difference of Longitude 70 deg. 00 minutes.

whereby the angles and Hypotenuse should be found by the fourth and second Cases of plain Triangles. But because in this kind of Projection, the degrees of Longitude and Latitude are not equal; (except in places near the Equinoctial) the degrees of Latitude, at every Parallel, exceeding the degrees of Longitude, in such proportion as the Equinoctial exceeds that parallel; therefore these differences of Longitude & Latitude, must first be expressed by some one common measure.



sure. And for that purpose serves the Table of Tangents, which sheweth how many equal leagues are from the Equinoctial to every degree of latitude: namely, of such equal leagues as a degree of Longitude doth contain 20.

Wherefore multiplying 70 deg. 00 min. the difference of Longitude by 20 I have 140 for the Meridional leagues contained in the difference of Longitude; also (by the last Problem) I find the meridional leagues contained in the difference of Latitude to be 472. so that D B is 472 leagues, and A B 1400 such leagues.

Therefore by the 4 Case of plain triangles.

As the differ. of latit. in leagues D B 472 co. arith. 931606
is in proportion to Radius.

So is the differ. of Longitude in leagues A B 1400. 314612

To the tangent of the rumb, & D 71 deg. 21 min. 30.47218

Which sheweth the course from the Summer-Islands to the Lizard to be East Northeast 3 d. 52 m. Easterly. or, from the Lizard to the Summer-Islands. W S W, 3 deg. 62 min. Westerly.

Secondly, for the distance in the Rumb.

Reduce the difference of Latitude into leagues (multiplying the degrees by 20) and to the Product adding one third of the minutes.

Then by the 2 Case of plain triangles.

As sine compl. the Rumb: A, 13 deg 39. min. to. ar. 649514
To the difference of Latitude D B, 362 leagues. 354654

To the distance A D 1100 leagues, 304168

And this is the distance measured in the Rumb; whereof we shall speak hereafter in Great Circle sailing, which is by Segments of several Rumbs often changing the course, but here whensoever we speak of the distance of two places, we mean their distance measured in their Rumb.

Prop. 3. The Latitude of two places, and their distance given: to find the Rumb, and difference of Longitude.

A ssume I sail from the Lizard, being in the Latitude of 50 degrees, upon some point to the Westward 1100 leagues, &c

then find myself in the Latitude of 32 deg. 25 min. I would know upon what point I have made my way good; and how much I have altered my Longitude?

The difference of Latitude D B, is 17 deg. 35 min. which reduced into Leagues, is 352 leagues. (As in the foregoing type)

As the distance sailed A D, 1100 leagues, &c. 695832
Is in proportion to Radius.

So is the difference of latitude D B. 352 leagues 254654

To sine complem the Rumb. A, 18 deg. 39 min. 9.30486

That is West Southwest 3 deg. 51 min. Westerly.

Secondly, for the difference of Longitude.

Find by the first Problem what Meridional leagues are contained in the difference of latitude, which are here 472, then say, As Radius

To the difference of latitude in leagues, D B, 472. 367394

So is the tangent of the Rumb. A D, 71 deg. 21 min. 47218

To the difference of longitude in leagues. A B. 1450 314612

Which leagues reduced into degrees, dividing them by 20, the quotient is 70 deg. the difference of Longitude required.

Prob. 4. By the Rumb, and Latitudes of two places given, to find their distance, and difference of Longitude.

Admit I sail from the Lizard, being in the Latitude of 50 deg. West Southwest 3 deg. 53 min. Westerly, till I find myself in the Latitude of 32 deg. 25 min: I demand how far I have sailed, and how much I have altered my Longitude?

The distance is found as in the latter part of the second Problem thus. The difference of Latitude converted into leagues is 352. Say then,

As sine complem. the rumb. A 18 deg. 39 min. 0,49514

To the difference of Latitude D B 352 leagues, 251654

So is Radius.

To the distance A D, 1100 leagues, 304168

And so much is the distance; the difference of Longitude may be found as in the latter part of the 5 Problem, saying,

As Radius, to the difference of Latitude in meridional leagues, so is the tangent of the Rumb, to the difference of Longitude in Leagues,

Prob.

ob. 5. By the difference of Longitude, Rumb, and one Latitude: to find the other Latitude and the distance?

Qmit I sail from the Lizard, being in the Latitude of 50 deg. West Southwest 3 deg. Westerly, till I have altered my Longitude 75 deg. how much have I laid the Pole, and how far am I in the Lizard?

Reduce the difference of Longitude into Leagues by 20, and it makes 1400; then say,

As the tangent of the Rumb : D 71 d. 21 m. 00. ar. 9.51829
the difference of Longitude in leagues, A B, 1400. 314162

is Radius

the difference of Latitude in leagues, D B, 472 267441

Which 472 leagues multiplied by 376, and the Product 472, and that divide by 10, and the quotient is 17747. which I subtract from the equal parts of the Latitude of 50. 00 min. which we found by the Problem to be at the tangent of 70 deg. 00 min. viz. 41893, and the remainder is 46, which I seek in the tangents, and find it in the tangent of 61 deg. 17 min. and a half, from which I subtract 45. 00 min. and the remainder is 16 deg. 17 min. and a half, which being doubled, is 32 deg 35 min. The latitude of the place to which I am come.

Secondly, for the Distance.

Having already the Rumb, and difference of Latitude, it may be found as in the second and fourth Problems; saying, As sine compl. the rumb, : A 18 d 39 m. 00. ar. 0.49514
the difference of Latitude, D B 352 leagues, 354654

is Radius,

the distance, A D 1100 leagues, 804163

ob. 6. By the Rumb, the distance, and one Latitude given: to find the other Latitude, and the difference of Longitude?

Qmit I sail VWest Southwest 3 deg. 51 min. VVesterly, 1100 leagues, and then find my self in the Latitude of 32 deg. 04 min. I demand the Latitude of the place from which I came, and the difference of Longitude between that and this?

First, for the difference of Latitude.

As Radius.

To the distance run A D 1100 leagues,	30416
So sine compl. the rumb s A, 18 deg. 39 min.	9548
To the difference of Latitude, D B 352 leagues,	25465

Which 352 leagues converted into deg. is 17 deg 35 minute the difference of latitude required; which added to 32 deg. 39 min. makes 50 deg. 00 min. the latitude of the first place.

The difference of Longitude is found as before in the third Problem, saying.

As Radius to the differ. in Latitude in Meridional leagues so is the tangent of the rumb, to the difference of Longitude in leagues.

And thus the difference of Longitude will be found as in this example to be 70 deg. 00 min.

If at any time you desire to convert this difference of Longitude found in any Parallel into leagues, you may do it after this Example.

7. Admit there be two places both in the Parallel of 50 degrees, which differ in Longitude 70 degrees 00 minutes: I demand the distance of these two places?

First, it is to be understood that the leagues of Longitude in any Parallel, are not in proportion to the distance in leagues as the Equinoctial is to that Parallel, or as the semidiameter of the one, is to the semidiameter of the other.

That is,

As Radius is in proportion.

To sine compl. the latitude,	50 deg. 00 min.	98080
So is difference of longitude.	1400 leagues,	31461
To the distance in that parallel,	900 leagues,	29541

Table for the angles which every Rumb makes with the Meridian.

North	South	D.	M.	South	North
90° 48'		02	49		
25 46		05	38		
minute		08	26		
deg. 3	1 by E	11	15	S by W	N by W 1
the third		14	04		
esagues		16	53		
itude in	N E	19	41		
in thi		22	30	S S W	NNW 2
f Lon	E by N	25	19		
it after	SE by S	28	08		
the Pa		30	56		
Long		33	45	SW by S	NW by N 3
manu		36	34		
	N E	39	23		
		42	11		
	SE	45	00	S W	N W 4
		47	49		
		50	37		
	NE by E	53	26		
		56	15	SW by W	NNW by W 5
		59	04		
		61	52		
	E N E	64	41		
		67	20	WSW	NNW 6
		70	19		
		73	07		
		75	56		
	E by N	78	45	W by S	W by N 7
		81	34		
		84	22		
		87	11		
	East	90	00	West	West 8



Propositions in ASTRONOMY and
NAVIGATION, performed by the
Tables of Artificial Sines, Tan-
gents, and Logarithms.

Prop. 1. *The Sun's place being known, to find his Declination.*

AS Radius 10, the sine of greatest declination, 23 deg 30 min. so is the sine of the Sun's distance from the next Equinoctial point, to the sine of his present declination.
So the Sun being in 20 deg. 36 minutes of *Taurus*, his declination will be found to be 17 deg. 58 min. almost.

Prop. 2. *The Sun's declination being given, to find his place in the Zodiack.*

AS the sine of the greatest declination is to Radius, so is the present declination to the present place.
So the Sun having 17 deg. 58 min. of North declination, his place will be found to be in 20 deg. 36 min. of *Taurus*, or 9 deg 24 minutes.

Prop. 3. *The Latitude of the place, and declination of the Sun given, to find his Amplitude.*

AS the Co-sine of the Latitude is to Radius, so the sine of the declination, to the sine of the amplitude.

So the Sun having 11 d. 48 m. of North declination, his amplitude will be found to be 19 d. 15 m. North also: For this is general, that if the Sun be in Northern Signes, as in *Aries, Taurus, Gemini, Cancer, Leo, Virgo*, he hath North declination, and North amplitude. And if in Southern Signes, as in *Libra, Scorpio, Sagittarius, Capricorn, Pisces, or Aquarius*, South declination, and South amplitude.

Prop. 4. *The Suns declination and amplitude given, to find the height of the Pole.*

As the sine of the amplitude, to the sine of the declination; so Radius to the Co-sine of the latitude.

So the declination being 11 deg. 43. min. and the amplitude 19 deg. 7 min. the height of the Equinoctial will be found to be 38 deg. 19 min. whose complement 51 deg. 41 min. is the height of the Pole.

Prop. 5. *The latitude of the place, and declination of the Sun given, to find his right Ascension.*

As Radius to the tangent of the Suns distance from the next Equinoctial point, so is the Co-sine of the greatest declination to the tangent of the right ascension.

So the Sun being in 20 deg. of *Taurus* (that is 50 deg. from the next Equinoctial point *Aries*) his right ascension will be found to be 47 deg. 32 min.

Prop. 6. *The latitude of the place, and declination of the Sun given, to find the ascensional difference, which is the time of the Suns rising or setting.*

As the Co-tangent of the latitude, to the tangent of the declination; so is Radius to the sine of the ascensional difference.

So the latitude being 53 deg. 30 min. North, and the declination

uation 20 deg. the difference of Ascension will be found to be 27 deg 14 min. which reduced into time (by allowing 15 deg. for one hour, and four minutes of time for one degree) doth give one hour, and almost 49 min. for the difference between the Sun's rising or setting, before or after the hour of six, according to the time of the year, that is, when the Sun is in Northern signs the Sun rises before, and sets after six, and in Southern signs he rises after, and sets before six.

Prop. 7. *The amplitude, and difference of ascension of the Sun, or Star given, to find his declination.*

AS the sine of the ascensional difference is to the Co sine of the amplitude, so is the Radius to the Co-sine of the declination.

So the ascensional difference being 27 deg. 34 min. shows the Sun rises at 4 a clock and 10 min. which converted into degrees makes 61 degrees 30 min. and the amplitude 33 deg. 38 min.

The declination will be found to be 20 deg. 10 min.

Prop. 8. *The Latitude and declination given, to find the Meridian altitude.*

IF the Sun have North declination, and the complement of the latitude to the declination, the Sum is the Meridian altitude: But if the Sun have South declination, subtract the declination from the complement of the latitude, the residue is the Meridian altitude.

So the latitude being 51 deg. 46 min. the complement thereof is 38 deg. 20 min. and let the declination be 23 deg. 30 min. North: Add 38 deg. 20 min. to 23 deg. 30 min. the Sum is 61 deg. 10 min. the Meridian altitude. But if the declination had been 23 deg. 30 min. South, subtract 23 deg. 30 min. from 38 deg. 20 min. the remain would be 14 deg. 50 min. for the Meridian altitude.

Prop.

Prop. 4. The latitude and declination known, to find the height of the Sun at any hour.

AS the Co-sine of the hour from the Meridian is to Radius, so the tangent of the latitude, to the tangent of a fourth ark.

So in the latitude of 51 deg. 30 min. and one hour from the Meridian, (which is either 11 or 1 a clock) this fourth ark will be found to be 52 deg. 28 min.

Then consider the declination of the Sun, and the hour proposed, if the latitude and declination be alike, both North as with us, and the hour proposed be between noon and six, take the declination out of the fourth ark, the remainder shall be a fifth Ark:--- But if the hour fall between six and midnight, or the latitude and declination be unlike (one North, the other South) add the declination to the fourth ark, and the sum shall be a fifth ark; if the Sun exceed 90 deg. take it from 180 deg. the remain is the fifth ark. The fifth ark being found,

Say,

As the sine of the fourth ark, to the sine of the latitude; so the Co-sine of the fifth Ark, to the sine of the altitude.

So the latitude being 51 deg. 30 min. North. the declination 13 d. 30 m. North; If it be required to find the Suns altitude at 7 in the morning, you shall find it to be 17 deg. 17. min.

Prop. 10. The latitude of the place, the declination of the Sun, and the altitude of the Sun given, to find his Azimuth.

Consider whether the Suns declination be North or South, so have you his distance from the Pole:--- Add the Suns distance from the Pole, the complement of your latitude, and the complement of your altitude all three into one sum, and from half that sum, subtract the distance of the Sun from the Pole, and note the difference;

Then say,

1. As Radius, to the Co-sine of the altitude, so the Co-sine of the latitude to a fourth sine.

2. As this fourth sine is to the sine of the halfsum; so is the sine of the difference to a seventh sine; unto which seventh sine, if you add the sine of 90 deg. half that sum will be the sine of an ark, whose complement being doubled is the Azimuth from the North part of the Meridian.

So

So if the latitude be 51 deg. 30 min. North, the declination 20 deg. South, and the altitude 12 deg. the Azimuth from the North part of the Meridian will be found to be 140 deg.

Prop. 11. *The latitude given, to find how many minutes, or miles of the Equinoctial, make a degree of longitude in any Parallel.*

As the sine of 90 deg. is to the sine of 60 deg. so the Co-sine of the latitude, to the miles answerable to a degree in the latitude desired.

So in the latitude of 51 deg. 40 min. 37 miles will answer one degree in the longitude.

Prop. 12. *The course and distance given, to find the difference of latitude.*

As the sine of 90 deg. to the Logarithm of the miles run, so the sine of the courses distance from East or West, to the difference of latitude.

So if the course be West S W (which is 22 deg. 30 m. from the West) the miles 225, the difference of latitude will be found to be 1 deg. 26 min.

Prop. 13. *The course and distance given, to find the difference of longitude.*

As the sine of 90 deg. is to the miles run, so is the sine of your course from South to North, to the miles you are departed from your first Meridian.

So if the course be N W by N (which is 33 deg. 45 min. from the North) the miles run 180, the number of miles which you are departed from the Meridian will be found to be 100. which if you divide by the number of miles answerable to a degree of longitude in the latitude, you then find yourself to be; the quotient gives you the degrees and minutes of difference of longitude.

Prop. 14. *The distance and departure from the Meridian given, to find the course.*

As the miles run, to the sine of 90, so the departure from the Meridian, to the sine of your course from North to South.

So if the departure from the Meridian be 75 miles, in running 150 miles, the course steered is 30 d. which is S W by S Southerly.

Prop. 15. *The latitude of the place, the declination and altitude of the Sun given, to find the hour of the day.*

Add the Suns distance from the Pole, the complement of the latitude, and the complement of the altitude into one Sum, and from half the sum subtract the complement of the altitude, noting the difference;

Then say,

1. As Radius, to the sine of the Suns distance from the Pole, so the Co-sine of the latitude, to a fourth sine — Then,
2. As this fourth sine, to the sine of the half-sum, so the sine of the difference, to a seventh sine; unto which seventh sine, if you add the sine of 90 deg. half that sum will be the sine of an ark, whose complement doubled and converted into time, is the hour required.

So if the latitude be 51 deg. 30 min. the declination 20 deg. Northward, and the altitude 12 deg. the time will be found to be 6 hours 24 min. almost.

The



The use of the following Tables in Questions that concern Geography.

Though there be diverse ways to find the distance of places, viz. by the Globe, by Maps, Geometrically, &c. Yet the most exact of all other is by Trigonometry, which way we will here lay down in three Propositions.

Prop. 1. Two places differing only in the Latitude to find their distance.

In this Proposition there are two varieties viz.

1. If the two places propounded lie under one and the same Meridian, and both of them on one side of the Equinoctial; you must subtract the lesser Latitude from the greater, and the remainder converted into miles (by allowing 60 miles to a degree) will be the distance required.

Example, *Vincentia* and *Augusta* lie under one and the same Meridian, and both on the North side of the Equinoctial; *Vincentia* having 44 d. 55 m. latitude, and *Augusta* 47 d. 42. min. latitude; the difference of latitude is 2 d. 47 m. which converted into miles by multiplying it by 60. and adding thereto the odd minutes, maketh 167 miles, and that is their distance.

2. If one place lie on the North, and the other on the South-side of the Equinoctial (yet both under the same Meridian) you must then add both the latitudes together, and the sum converted into miles, will give their distance.

Prop. 2. Two places differing only in Longitude, being given, to find their distance.

In this Proposition also there are two varieties.

1. If the two places propounded lie under the Equinoctial, then

hen the difference of their longitudes reduced into miles (allowing 60 miles to a degree) giveth the distance of the places required.

Example. It is required to know the distance of the Island *Samara* from the Island *St. Thomas*, (both lying under the Equinoctial) the Island *Samara* hath long. 137 d. 10 m. and the Island of *S. Thomas* hath long. 33 d. 10 min. therefore the difference of their longitude is 104 d. which multiplied by 60, maketh 2640 miles, which is the distance of the said places.

2. But if the two places propounded differ only in longitude, and lie not under the Equinoctial, but under some other intermediate Parallel, between the Equinoctial and one of the Poles, then to find their distance, the proportion will be,

As the Radius, or 90 deg. is to the Co-sine of the common latitude;

So is the sine of half the difference of longitude, to the sine of half their distance.

Example. The Cities of *Compostella* and *Constantinople* have both one latitude, viz. 43 deg. a min. but differ in longitude 43 deg. 15. min. The complement of their latitude is 47 deg. and the half longitude is 21 deg. 37 min. 30 seconds; therefore the operation is thus to be framed.

The Radius or sine of 90 deg. 10.

the Co-sine of the common latitude 47 d. 9.8641

The sine of the half difference of longitude 21 d. 37 m. 30 sec. 3 9.1664

The sine of half their distance 9.43053

whose arch 15 d. 38 m. being doubled, giveth 31 d. 16 m. which converted into miles (as before is taught) giveth 1876, which is the distance between the two places required.

Prop. 3. Two places being given, which differ both in longitude and latitude, to find their distance.

In this Proposition is contained three varieties.

1. If one place be under the Equinoctial Circle, and the other towards either Pole, then the proportion is,

As the Radius or sine of 90 degrees

Is to the Co-sine of the difference of longitude:

So is the Co-sine of the latitude given,

To the Co-sine of their distance required.

Example

Example. If it were required to find the distance of the Island of St. Thoma (which lieth directly under the Equinoctial, and hath longitude 38 deg.) and the City of London (which hath 51 d. 30 min. latitude, and 20 d. longitude) their distance will be found to be 3122 miles.

2. If both the places propounded be without the Equinoctial, and on the Northern or Southern side thereof, then the proportion must be wrought at two operations, and because there is some difficulty therein, we have added the following figure, which will make it perspicuous to the meanest capacity.

Let D represent London, whose latitude is F D 51 deg. 30 min. and longitude 20 d. no min. and let O represent Jerusalem, whose latitude M O is 31 deg. 40 min. and longitude 66 degrees, which being known, you have given (1)

the side B D, the complement of the latitude of London, 38 degrees, 34 min. (2) the side B O, the complement of the latitude of Jerusalem, 58 degrees, 20 min. (3) the angle D B O (whose measure is F M) the difference of latitude 46 deg. 20 min and it is required to find the side D B. Therefore the proportion is,

1. As the Radius B M 90 degrees,

10,00000000

To the Co-sine of D B O 44 degrees.

9.3417712

So is the tangent of D B 38 deg. 30. min.

9.9006052

To the tangent of B P 28 deg. 55. min.

9.7423764

Which being subtracted from B O 58 deg. 20 min. there remaineth O P 29 deg 25 min. then say,

2. As the Co-sine of B P 61 d. 5 min.

9.9421688

To the Co-sine of P O 60 d 35 min.

9.9100535

So is the Co-sine of D B 51 d. 30 min.

9.8915443

19,8935978

To.



To the Co-sine of D O 5 d. 5 min. 9.3914230
 whose complement is 38 deg. 5 m. which converted into miles
 before is taught, ~~are~~ 2331 miles, and such is the distance re-
 quired.

If the two places propounded differ both in longitude and
 latitude, and be both of them without the Equinoctial, and one
 them towards the North, and the other toward the South
 e, then the proportion is

As the Radius is to the Co-sine of the difference of longi-
 tude,
 is the Co-tangent of one of the latitudes, to the Tangent of
 another ark,

Which being subtracted out of the other latitude, and 90 d.
 added thereto, say

2 As the Co-sine of the ark found, is to the Co-sine of the
 remaining,

So is the Co-sine of the latitude first taken, to the Co-sine of
 the distance.

These are all the varieties that can possibly happen in any
 opposition concerning the distance of places, and is the exactest
 y that can be invented, provided the longitude and latitude
 truly given.

A Table shewing the Longitude and Latitude of all the principal Cities and places in Europe, according to the Observations of *Tycho*, *Longomontanus*, *Kepler*, and others.

The Names of the Places	Latitude			Longitude
	D	M	S	D
Alexandria in Egypt	30	59	60	
Amsterdam	52	26	28	
Antioch	37	26	70	
Antwerp in Brabant	51	32	28	
Aquileia	51	06	48	
Athens	37	42	52	
Au à la Vindel	43	22	35	
Babylon	35	00	73	
Barwick	55	50	19	
Bridge in Flanders	51	30	34	
Brunswick	52	16	34	
Brandenburg	52	30	37	
Calecuse in India	11	20	111	
Carlile	54	50	19	
Canterbury	51	15	20	
Cambridge	52	17	20	
Calice	50	30	20	
Constantinople	43	05	55	
Forer	51	20	21	
Dublin	54	40	12	
Damascus	33	00	69	
Edinburgh in Scotland	56	26	20	
Ephesus	37	40	57	
Frankford upon Merse	50	03	32	
Frasiford upon Od.	52	20	38	
Florence	43	10	35	

The Names of the
Places.

Latitude Longit.
D. M. D. M.

neva	45	25	19	50
amburg	53	42	34	15
erusalem	32	10	70	45
colne	53	00	20	30
ONDON	51	32	20	00
icester	52	42	19	42
born	39	38	09	10
iddleburg in Zealand	51	31	26	40
ount Sinai	30	00	64	00
arpurge	50	43	32	35
unster in Westphal.	51	34	31	10
uples in Italy	40	42	38	35
emark in England	53	01	20	07
arbone in France	41	50	25	05
intve	35	56	80	30
orimberg	49	26	35	45
xford	51	50	19	00
rague	50	06	38	15
aris	48	40	20	20
adua	45	06	36	25
eterburg	52	30	20	20
ome	42	00	36	30
Quinzay	37	40	19	00
terdam	51	55	27	35
ed-sea	29	50	63	30
ardes in Lydia	38	34	59	45
alisburg	47	42	37	50
stamford	52	36	20	10
spier	49	24	33	00
ubing Wittenberg	48	34	33	45
Venice	45	15	36	15
Vienna	48	20	40	00
raniburg	55	54	36	45
ittenburg	51	50	37	36
orms	50	25	31	30
ork	33	30	20	10

The use of the Tables of the Sun and Stars
Right Ascension.

At the end of this Book, you have two Tables, the one shewing the right Ascension of the Sun every day in the year, the other sheweth the right Ascension, and Declination of certain of the most eminent fixed Stars. I will in this place shew how by the joint use of these two Tables, any Star mentioned in the Table of Stars will come to the Meridian, and the rule will hold general for any Star, whose right Ascension and Declination is known. The manner of working is as followeth.

The R U L E.

Subtract the right Ascension of the Sun from the right Ascension of the Star, (whose time of coming to the Meridian is required) the Remainder is the time of the said Stars coming to the Meridian, Afternoon but if the right Ascension of the Star be less than the right Ascension of the Sun, add Twenty four hours thereto, and subtract the right Ascension of the Sun therefrom, the Remainder is the time of the Stars coming to the Meridian.

Example. Upon the Eleventh of December, it is required to know when the Bulls eye comes to the Meridian; by your Table of the Suns right Ascension you find that the Suns right Ascension on the Eleventh of December, is Seventeen hours fifty nine minutes, and by your Table of Stars you find the right Ascension of the Bulls-eye to be four hours ten minutes. Now, (according to your rule) because the right Ascension of the Sun is more than the right Ascension of the Stars, and Subtraction cannot be made, you must add

Twenty four hours to the Stars Declination, so will the Sun be Twenty eight hours ten minutes; from which take Seventeen hours fifty nine minutes, the right Ascension of the Sun, the Remainder will be Ten hours and Seven minutes, at which time the Bulls-eye will come into the Meridian on the Eleventh of December, after it enter the Sun, that is, at eleven minutes past ten at night, the Bulls-eye will be due South, the like of any other Star whose right Ascension is known. See the following work.

	ho. mi.
right Ascension of the Sun on the Eleventh of Decemb.	17 59
right Ascension of the Bulls-eye	4 10
Twenty four hours added	24 0
the Sum	28 10
the Suns right Ascension subtracted	17 59
remains	10 11

the true time that the Bulls-eye will come to the Meridian.

This Rule here delivered is of excellent use for Seamen, thereby to find their Latitude; for it is to be noted, that the Rules which you observe for finding of your Latitude by the Sun, the same may be performed by the Stars, they being upon the Meridian, as is already noted in the last Page of my doctrine of Triangles, to which I refer you.

The Altitude of any known Star being given, to find thereby the hour of the night.

By the former Rule find the time of the known Stars coming to the Meridian, on the day proposed. Then seek out the Horary distance of that Star from the Meridian, which may be found by the same Rule, as you find the hour of the day by the Sun, as is Prop. 15.

36 Of the Variation of the Compass.

These things being found, if the Star be on the East side, not yet come to the Meridian, the difference of those two numbers of hours is the hour of the night; but if the Star be Westward past the Meridian, the sum of those numbers of hours is the hour of the night.

Of finding the Variation of the Compass.

By the third Proposition before going, you are taught to find the Sun's amplitude, that is, how far distant the Sun riseth or setteth from the true East or West point of the Horizon.

Thus if the Latitude given were Fifty one degrees thirty two minutes, and the Sun's Declination Fifteen degrees ten minutes North, the Amplitude will be found to be Twenty four degrees fifty two minutes North, because the Sun's Declination was North.

Of the Amplitude thus found, there is often use made at Sea, for finding the Variation of the Compass; which is done after this manner.

Supposing the circumference or outermost edge of the Card or Flie of the Compass to be divided into three hundred sixty degrees, and the Points of the Needles to be placed directly under the Flower de Luce, or North and South Points: You are to observe at Sun-rising or setting, how many degrees the Sun is from the East or West Points of the Compass, which number of degrees, if they agree with the Amplitude found by this Position, as is before shewed, and be on the same side, than hath the Compass no Variation; but if they differ, look how many degrees that difference is, so much is the Variation.

As for Example; Admit I find the Amplitude to

Twenty four degrees fifty two minutes Northerly, when I know that the Sun should set almost Twenty five degrees from the West to the Northwards ; but observing at Sun-setting with my Compass, admit I find it set but nineteen degrees from the West Point of my compass to the Northwards, then hereby I gather that the Variation of my Compass is almost six degrees: And thus you may find how much the Variation of the Compass is. Now

To find which way the Compass varieth.

If the degree of the Compass which directly respects the Sun at his rising or setting, (namely, the degree will be of Amplitude found as before) be more towards the right hand, then the Sun rising or setting, the Variation is Easterly: but if it be more towards the left hand, the Variation is Westerly: Because when a mans face is towards the North, the East is on his right hand, and the West on his left.

As in this Example, I find by the Amplitude that the Sun should be set almost Twenty five degrees from the West point of my Compass Northerly; but setting the Sun, I see that the Twenty fifth degree of my Compass is more towards the right hand than the place of Sun set, therefore I conclude, that the Variation is Easterly.

And thus is the Variation of the Compass found to be almost six degrees Easterly, so that the North point of the Compass shews not the true North, but points almost six degrees to the Eastward of the North, and consequently all the other points of the Compass direct more towards the right hand, than they should do by

almost six degrees: And the like in all Points is to be understood, if the observation had been made at Sun-rising.

Note. It is fittest to make these observations when the Sun seems to be a little above the Horizon, namely, when the lower edge of the Sun seems almost to touch the Horizon, though by reason of his refraction and parallax he seems to be above it.

By the Altitudes of any two known fixed Stars taken, when they are both in the same Azimuth, to find the height of the Pole.

First say,

As the sine of the difference of the Stars Altitudes, is to the sine of the difference of their right Ascension; so is the sine of the nearer Stars distance from the Apparent Pole, to the sine of an angle to be kept.

Again, Compare the furthest Stars distance from the Pole, with the distance from the Zenith, and say,

As the Radius, is to the sine of the complement of the Angle kept; so is the Tangent of the lesser of the compared arches to the Tangent of the first base.

Subduct the first base out of the greater of the two compared arches; & the remains shall be the second base.

Then lastly say,

As the sine of the complement of the first base, Is to the sine of the complement of the second base; So is the sine of the complement of the lesser of the two compared arches,

To the sine of the height of the Pole or Latitude.

is
Sun-
when day of the week the first
meli, day of March will fall
touch upon for 20 years.

1661	Friday
1662	Saturday
1663	Sunday
1664	Tuesday
1665	Wednesday
1666	Thursday
1667	Friday
1668	Sunday
1669	Monday
1670	Tuesday
1671	Wednesday
1672	Friday
1673	Saturday
1674	Sunday
1675	Monday
1676	Wednesday
1677	Thursday
1678	Friday
1679	Saturday
1680	Monday

THE
Description and Use
O F

An Universal
A L M A N A C K.

Before you can well make use of this Almanack, you must know on what day of the week the first day of March falls in any year, which the Table adjoyning plainly sheweth for 20 years, viz. to the year 1680, which Table may be continued so far as you please, by leaving out one day between every fourth year, as you see done in the years of this Table.

The day of the week on which the first day of March falls upon being known, the day of the month for ever may be easily found, as by Example following will appear.

A Figure of the Universal Almanack.

March	August	May	October	April	September	June
Novem.		January		July	Decemb.	Februa.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

The Uses of the Universal Almanack.

The Uses of this Almanack are only two, The first is, Any day of the Week in any Month or Year being given, to know what day of the Month it is.

The second use is, Any year, and day of any Month of that year being given, to know what day of the week it is.

Example of the first. Let it be required to know what day of the Month the first Monday in *August* this year 1664 will be.

By the first Table you shall find the first of *March* was Tuesday. Now look in the Almanack (in the head thereof) for the Month of *August*, under which you shall find these numbers 1, 9, 16, 23, 30, which denotes, that the second, the 9th, the 16th, the 23 and the 30th. days of *August* were Tuesdays, because the first of *March* was a Tuesday, than the ninth day of *August* being Tuesday, the eighth day must be Monday, and so for any other Month. As in the Months of *April* or *July*, the 5, 12, 19, and 26 days of either of those months are Tuesdays.

Example of the second, What day of the Week will the 20 day of *October* be in the year 1673? The first of *March* in that year will be Saturday; therefore the 4, 11, 18, and 25th. days of *October* are Saturdays. Then the 18th, being Saturday, the 20th, will be Monday.

Thus for every year what day of the week the first of *March* is of, the dayes under any Month of that year are of the same day of the week, whether Sunday, Monday, or Tuesday, &c. and so for ever.

Books lately printed for Geo. Hurlock, at St. Magnus Church-Corner, near Thames-street by London-Bridge.

THE Complete Shipwright, Teaching the proportions used by experienced Shipwrights, according to their Custom of Building, with the Drawing of a Draught, the making and marking of a Bend of Molds, &c. both by Arithmetick and Geometry. By Edm. Bushnell Shipwright.

Also the Complete Modelist for Rigging of Ships.

F I N I S.

With great

A

TRIANGULAR CANON Logarithmical.

OR

A TABLE of Artificial
Sines, Tangents, and the Com-
plements Arithmetical of Sines
supplying the use of
Secants.

To Radius 10,00000, and to every Degree
and Minute of the Quadrant.

London,

Printed by W. Godbid for George Hurlock,
and are to be sold at his Shop at St. Magnus-
Church-Corner in Thames-Street, near
London-Bridge. 1667.

АЛАНДІЯТ

САДА

ЛІДІЯ

ЛІ

АЛАНДІЯТ

ЛІДІЯ

ЛІДІЯ

ЛІДІЯ

АЛАНДІЯТ

ЛІДІЯ

ЛІДІЯ

ЛІДІЯ

АЛАНДІЯТ

ЛІДІЯ

ЛІДІЯ

To the R E A D E R.



HIS Table of Artificial
Sines, Tangents, & Arith-
metical Complements of
Sines to supply the use
of Secants, with a Chiliad

of One Thousand *Logarithms*, is
thought fit (by Mr. Rich. Norwood, and
Hen. Bond) to be printed to the *Radius*
10,00000, that such as are desirous
thereof may have it at a more reason-
able rate, than the other larger *Tables*
are at; and because it is in a more
portable volume, and is of the same
use that the other *Tables* are; For by
these *Tables* may be resolved all plain
and Spherical *Triangles*, and all *Pro-
blems* of Sayling, either according to
the plain *Sea-chart*, or according to
Mercators-chart (without any other
Meridional parts; then what are con-
tained in these *Tables*) as it may partly
appear, if you look in the latter end
of the *Appendix* of the *Path-way to per-
fect Sayling*, now newly Printed, Vale.

(4)

Sine	Sine comple.	Tang.	Tangent complem.	com. ar. com. ar. of Sine. of si. co.
0	0 1000000	0	Infinite	6 0 1000 000 000000
1	646372 999999	646372	1353627 59	353627 000000
2	676475 999999	676475	1323524 58	323524 000000
3	694084 999999	694084	1305915 57	305915 000000
4	706578 999999	706578	1293421 56	293421 000000
5	716269 999999	716269	1283730 55	283730 000000
6	724187 999999	724187	1275812 54	275812 000000
7	730882 999999	730882	1269117 53	269117 000000
8	736681 999999	736681	1263318 52	263318 000000
9	741796 999999	741796	1258103 51	258103 000000
10	746372 999999	746372	1253627 50	253627 000000
11	750511 999999	750512	1249487 49	249488 000000
12	754290 999999	754290	1245709 48	241709 000000
13	757766 999999	757767	1242232 47	242233 000000
14	760985 999999	760985	1239014 46	239014 000000
15	763981 999999	763982	1236017 45	236018 000000
16	766784 999999	766784	1233215 44	233215 000000
17	769417 999999	769417	1230582 43	230582 000000
18	771399 999999	771900	1228099 42	228100 000000
19	774247 999999	774248	1225751 41	225752 000000
20	776475 999999	776476	1223523 40	223524 000000
21	778594 999999	778595	1221404 39	221405 000000
22	780614 999999	780615	1219384 38	219385 000000
23	782545 999999	782546	1217453 37	217454 000000
24	784393 999999	784394	1215605 36	215606 000001
25	786166 999999	786167	1213832 35	213833 000001
26	787869 999999	787870	1212129 34	212130 000001
27	789508 999999	789509	1210490 33	210491 000001
28	791087 999999	791089	1208910 32	208912 000001
29	792611 999999	792613	1207386 31	207388 000001
30	794084 999999	794085	1205914 30	205915 000001

Sine
Comple.

Sine

Tangent
Complem.

Tang.

89

O	Sine.	Sine Comple.	Tang.	Tangent Comple.	Cum. at. 60°. 1st. of Sine.	Cum. at. 60°. 1st. of Si. & Co.
30	794084	999998	794085	1205914	30 205915	000001
31	795508	999998	795509	1204490	29 204491	000001
32	796886	999998	796888	1203111	28 203113	000001
33	798223	999998	798225	1201774	27 201776	000003
34	799519	999997	799521	1200478	26 200480	000002
35	800778	999997	800780	1199219	25 199221	000002
36	802002	999997	802004	1197995	24 197997	000002
37	803191	999997	803194	1196805	23 196808	000002
38	804350	999997	804352	1195647	22 195649	000002
39	805478	999997	805480	1194519	21 194521	000002
40	806577	999997	806580	1193419	20 193422	000003
41	807649	999996	807653	1192346	19 192350	000003
42	808696	999996	808699	1191300	18 191303	000003
43	809718	999996	809721	1190278	17 190281	000003
44	810716	999996	810720	1189279	16 189283	000003
45	811692	999996	811694	1188303	15 188307	000003
46	812647	999996	812650	1187349	14 187352	000003
47	813581	999995	813585	1186414	13 186418	000004
48	814495	999995	814499	1185550	12 185504	000004
49	815390	999995	815395	1184604	11 184609	000004
50	816268	999995	816272	1183727	10 183731	000004
51	817128	999995	817132	1182867	9 182871	000004
52	817971	999995	817976	1182023	8 182028	000004
53	818798	999994	818803	1181196	7 181201	000005
54	819610	999994	819613	1180384	6 180389	000005
55	820407	999994	820412	1179587	5 179592	000005
56	821189	999994	821195	1178804	4 178810	000005
57	821958	999994	821964	1178035	3 178041	000005
58	822713	999993	822719	1177280	2 177286	000006
59	823455	999993	823462	1176537	1 176544	000006
60	824185	999993	824192	1175807	0 175814	000006

Sine
Comple.

Sine.

Tangent
Comple.

Tang. | 89

I	Sine.	Sine comple.	Tang.	Tangent complem.	com. ar. com. ar. of Sine. of f. co.
0	824185	999992	824192	11758076	175814000006
1	824903	999993	824910	117508959	175096000006
2	825609	999992	825616	117438358	174390000007
3	826304	999992	826311	117368857	173695000007
4	826988	999992	826995	117300456	173011000007
5	827661	999992	827669	117233055	172338000007
6	828324	999992	828332	117166754	171675000008
7	828977	999991	828985	117101453	171022009008
8	829630	999991	829629	117037052	170379000008
9	830254	999991	830263	116973651	169745000008
10	830879	999991	830888	116911150	169120000009
11	831495	999990	831504	116849549	168504000009
12	832102	999990	832112	116788748	167897000009
13	832701	999990	832711	116728847	167298000009
14	833292	999989	833302	116669746	166707000010
15	833875	999989	833885	116611445	166124000010
16	834450	999989	834461	116553844	165549000010
17	835018	999989	835028	116497143	164921000010
18	835578	999988	835589	116441042	164421000011
19	836131	999988	836142	116385741	163868000011
20	836677	999988	836680	116331040	163322000011
21	837217	999987	837229	116277039	162782000012
22	837749	999987	837762	116223738	162250000012
23	838276	999987	838288	116171137	161723000012
24	838796	999987	838809	116119036	161203000012
25	839310	999986	839323	116067635	160689000012
26	839817	999986	839831	116016834	160182000013
27	840319	999986	840333	115966633	159680000013
28	840816	999985	840830	115916922	159183000014
29	841306	999985	841321	115867831	158693000014
30	841791	999985	841806	115819320	158208000014

Sine
Comple. | Sine. | Tangent
Complem. | Tang. 88

I	Sine Comple.	Tang.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Si. co.
30	841791	999985	841806	1158193	30 158208 0000014
31	842271	999984	842286	1157713	29 157728 0000015
32	842746	999984	842761	1157238	28 157253 0000015
33	843215	999984	843231	1156768	27 156784 0000015
34	843679	999983	843696	1156303	26 156320 0000016
35	844139	999982	844156	1155843	25 155860 0000016
36	844594	999983	844611	1155388	24 155405 0000016
37	845044	999982	845061	1154938	23 154955 0000017
38	845489	999982	845506	1154493	22 154510 0000017
39	845930	999981	845948	1154051	21 154069 0000018
40	846366	999981	846384	1153614	20 153633 0000018
41	846798	999981	846817	1153182	19 153201 0000018
42	847226	999980	847245	1152754	18 152773 0000019
43	847649	999980	847669	1152330	17 152350 0000019
44	848069	999980	848089	1151910	16 151930 0000019
45	848484	999979	848505	1151494	15 151515 0000020
46	848896	999979	848916	1151083	14 151103 0000020
47	849303	999978	849325	1150674	13 150696 0000021
48	849707	999978	849729	1150270	12 150292 0000021
49	850107	999978	850129	1149870	11 149892 0000021
50	850504	999977	850526	1149473	10 149495 0000022
51	850897	999977	850920	1149079	9 149102 0000022
52	851286	999976	851309	1148690	8 148713 0000023
53	851672	999976	851696	1148303	7 148327 0000023
54	852055	999976	852079	1147920	6 147944 0000023
55	852424	999975	852458	1147541	5 147565 0000024
56	852810	999975	852834	1147165	4 147189 0000024
57	853182	999974	853207	1146792	3 146817 0000025
58	853552	999974	853577	1146422	2 146447 0000025
59	853918	999973	853944	1146055	1 146081 0000026
60	854281	999973	854308	1145691	0 145718 0000026

2	Sinc.	Sine Comple.	Tang.	Tangent Comple.	com. ar.	com. ar.
					of sine	of β . co.
0	854281	999973	854308	114569160	145718	000026
1	854642	999973	854669	114533059	145357	000026
2	854999	999972	855026	114497358	145000	000037
3	855353	999972	855381	114461857	144646	000027
4	855705	999971	855733	114426656	144294	000028
5	856054	999971	856082	114391755	143945	000028
6	856399	999970	856429	114357054	143600	000029
7	856743	999970	856772	114322753	143256	000029
8	857083	999969	857113	114288652	142916	000030
9	857421	999969	857451	114254851	142578	000030
10	857756	999968	857787	114221250	142242	000031
11	858089	999968	858120	114187949	141910	000031
12	858419	999967	858451	114154848	141580	000032
13	858746	999967	858779	114132047	141253	000032
14	859072	999967	859105	114089446	140927	000033
15	859394	999966	859428	114057145	140605	000033
16	859715	999966	859749	114025044	140284	000033
17	860033	999965	860067	113993243	139966	000034
18	860348	999965	860383	113961642	139651	000035
19	860662	999964	860697	113930241	139337	000035
20	860973	999963	861009	113899040	139026	000036
21	851282	999963	861318	113868139	138717	000036
22	851589	999962	861626	113837338	138410	000037
23	861893	999962	861931	113806837	138106	000037
24	862196	999961	862234	113776536	137803	000038
25	862496	999961	862535	113746435	137503	000038
26	862794	999960	862834	113716534	137205	000039
27	863091	999960	863130	113686933	136908	000039
28	863385	999959	863425	113657432	136614	000040
29	863677	999959	863718	113628131	136322	000040
30	863967	999958	864009	113599030	136032	000041

Sine
Comple. | Sine. | Tangent
Complem. | Tang. | 87

	Sine complete.	Tang. complete.	Tangent complete.	com. ar. of Sine.	com. ar. of si. co.
26	863967999958	864009	113599030	136024000041	
26	864256999958	864298	113570129	135743000041	
27	864542999957	864585	113541428	135457000042	
27	864827999956	864870	113512927	135172000043	
28	865110999956	865153	113484826	134889000043	
28	865391999955	865425	113456425	134608000044	
29	865670999955	865714	113428524	134329000044	
29	865947999954	865992	113400723	134051000045	
30	866223999954	866268	113373122	133776000045	
30	866496999953	866543	113345621	133503000046	
31	866764999952	866815	113218420	133221000047	
31	867039999952	867036	113291319	132960000047	
32	867308999951	867356	113264318	132691000048	
32	867575999951	867623	113237617	132424000048	
33	867840999950	867889	113211016	132159000049	
33	868104999949	868164	113184515	131895000049	
34	868366999949	868417	113158214	131633000050	
34	868627999948	868678	113132113	131372000051	
35	868886999948	868938	113106112	131113000051	
35	869143999947	869196	113080311	130856000052	
36	869299999946	869452	113054710	130600000052	
36	869654999946	869708	11302919	130345000053	
37	869907999945	869961	11300388	130092000054	
37	870158999944	870213	11297867	129841000055	
38	870408999944	870464	11295356	129591000055	
38	870657999942	870713	11292845	129342000056	
39	870904999943	870961	11290384	129095000056	
39	871150999942	871208	11287913	128849000057	
40	871395999941	871453	11285463	128604000058	
40	871638999941	871697	11283021	128361000058	
41	871880999940	871939	11280600	128119000059	

Sine
complete. | Sine. | Tangent
complete. | Tang. | 87

3	Sine Comple.	Sine Comple.	Tang.	Tangent Complem.	Com. ar. of Sine.	Com. of Sine.	Sin
0	871880	999949	871939	1128060	60	128119	00000000
1	872120	999939	872180	1127819	59	127879	00000000
2	872359	999939	872420	1127579	58	127640	00000000
3	872597	999938	872658	1127341	57	127402	00000000
4	872833	999937	872895	1127104	56	127166	00000000
5	873068	999937	873121	1126868	55	126931	00000000
6	873302	999936	873366	1126633	54	126697	00000000
7	873535	999935	873599	1126400	53	126464	00000000
8	873766	999935	873831	1126168	52	126233	00000000
9	873996	999934	874062	1125937	51	126003	00000000
10	874225	999933	874392	1125707	50	125774	00000000
11	874453	999932	874520	1125479	49	125546	00000000
12	874680	999932	874747	1125252	48	125319	00000000
13	874905	999931	874974	1125026	47	125094	00000000
14	875129	999930	875198	1124801	46	124870	00000000
15	875352	999930	875422	1124577	45	124647	00000000
16	875574	999929	875645	1124354	44	124425	00000000
17	875795	999928	875866	1124133	43	124204	00000000
18	876015	999927	876087	1123912	42	123984	00000000
19	876233	999927	876306	1123693	41	123766	00000000
20	876451	999926	876524	1123475	40	123548	00000000
21	876667	999925	876741	1123258	39	123332	00000000
22	876882	999924	876957	1123042	38	123117	00000000
23	877096	999924	877172	1122827	37	122903	00000000
24	877310	999923	877386	1122613	36	122689	00000000
25	877522	999922	877599	1122400	35	122477	00000000
26	877733	999921	877811	1122188	34	122266	00000000
27	877943	999921	878022	1121977	33	122056	00000000
28	878152	999920	878231	1121768	32	121847	00000000
29	878360	999919	878440	1121559	31	121639	00000000
30	878567	999918	878648	1121351	30	121432	00000000

Com. of Si.	Sine Comple.	Tang. Comple.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Si. &c.
000	78567 999918	878648	1131851 30	121432	000081
000	78773 999918	878855	1121142 29	121226	000081
000	78978 999917	879061	1120938 28	121021	000082
000	79182 999916	879266	1120733 27	120817	000083
000	79385 999915	879470	1120529 26	120614	000084
000	79588 999915	879673	1120326 25	120411	000084
000	79789 999914	879875	1120124 24	120210	000085
000	79989 999913	880076	1119923 23	120010	000086
000	80189 999912	880276	1119723 22	119810	000087
000	80387 999911	880475	1119524 21	119612	000088
000	80585 999911	880674	1119325 20	119414	000088
000	80781 999910	880871	1119128 19	119218	000089
000	80977 999909	881068	1118931 18	119022	000090
000	81172 999908	881264	1118735 17	118827	000091
000	881366 999907	881458	1118541 16	118633	000092
000	881559 999906	881652	1118347 15	118440	000093
000	881752 999906	881846	1118153 14	118247	000093
000	881943 999905	882037	1117961 13	118056	000094
000	882134 999904	882229	1117770 12	117865	000095
000	882324 999903	882420	1117579 11	117675	000096
000	882512 999902	882610	1117389 10	117487	000097
000	882701 999901	882799	1117200 9	117298	000098
000	882888 999901	882987	1117012 8	117111	000098
000	883074 999900	883174	1116825 7	116925	000099
000	883260 999899	883361	1116388 6	116739	000100
000	883445 999898	883547	1116452 5	116554	000101
000	883629 999897	883732	1116267 4	116370	000102
000	883813 999896	883916	1116083 3	116186	000103
000	883995 999895	884099	1115900 2	116004	000104
000	884177 999894	884182	1115717 1	115822	000105
000	884358 999894	884464	1115535 0	115641	000105

	Sine	Sine	Tang.	Tangent	Com.	Com.	Com.	Sine
	Comple.	Comple.		Complem.	ar.	of Sine.	of Sine.	
0	884358	999894	884464	1115535	60	115641	0001	894
1	884538	999893	884645	1115354	59	115461	0001	896
2	884718	999892	884825	1115174	58	115281	0001	897
3	884897	999891	885005	1114994	57	115102	0001	899
4	885075	999890	885184	1114815	56	114924	0001	901
5	885252	999889	885362	1114637	55	114747	0001	902
6	885429	999888	885540	1114459	54	114570	0001	904
7	885604	999887	885717	1114282	53	114395	0001	905
8	885780	999886	885893	1114106	52	114219	0001	906
9	885954	999885	886068	1113931	51	114045	0001	907
10	886128	999885	886243	1113756	50	113871	0001	908
11	886301	999884	886417	1113582	49	113698	0001	909
12	886473	999883	886590	1113409	48	113526	0001	910
13	886645	999882	886763	1113236	47	113354	0001	911
14	886816	999881	886935	1113064	46	113183	0001	912
15	886986	999880	887106	1112893	45	113013	0001	913
16	887156	999879	887276	1112723	44	112843	0001	914
17	887325	999878	887446	1112553	43	112674	0001	915
18	887493	999877	887616	1112383	42	112506	0001	916
19	887661	999876	887784	1112215	41	112338	0001	917
20	887828	999875	887962	1112047	40	112171	0001	918
21	887994	999874	888120	1111879	39	112005	0001	919
22	888160	999873	888286	1111713	38	111839	0001	920
23	888325	999872	888453	1111546	37	111674	0001	921
24	888490	999871	888618	1111381	36	111509	0001	922
25	888654	999870	888783	1111216	35	111345	0001	923
26	888817	999869	888947	1111052	34	111182	0001	924
27	888980	999868	889111	1110888	33	111019	0001	925
28	889142	999867	889274	1110725	32	110857	0001	926
29	889303	999866	889436	1110563	31	110696	0001	927
30	889464	999865	889598	1110401	30	110535	0001	928

Sine.	Sine Comple.	Tang.	Tang. Comple.	Com. ar. of Sine.	Com. ar. of Si. co.
89464	999865	889598	1110401	30	110535 000134
89624	999864	889759	1110240	29	110375 000135
89784	999863	889920	1110079	28	110215 000136
89943	999862	890080	1109919	27	110056 000137
90101	999861	890239	1109760	26	109898 000138
90259	999860	890398	1109501	25	109740 000139
90416	999859	890556	1109443	24	109583 000140
90573	999858	890714	1109285	23	109426 000141
90729	999857	890871	1109128	22	109270 000142
90885	999856	891028	1108971	21	109114 000143
91040	999855	891184	1108815	20	108959 000144
91194	999854	891340	1108659	19	108805 000145
91348	999853	891495	1108504	18	108651 000146
91502	999852	891649	1108350	17	108497 000147
91655	999851	891803	1108196	16	108344 000148
91807	999850	891956	1108043	15	108192 000149
91959	999849	892109	1107890	14	108040 000150
92110	999848	892261	1107738	13	107889 000151
92261	999847	892413	1107586	12	107738 000152
92411	999846	892564	1107435	11	107588 000153
92560	999845	892715	1107284	10	107429 000154
92710	999844	892865	1107134	9	107289 000155
92858	999843	893015	1106984	8	107141 000156
93006	999842	893164	1106835	7	106993 000157
93154	999840	893313	1106686	6	106845 000159
93301	999829	893461	1106538	5	106698 000160
93448	999838	893609	1106390	4	106551 000161
93594	999837	893756	1106243	3	106405 000162
93739	999836	893903	1106096	2	106260 000163
93884	999835	894049	1105950	1	106115 000164
94029	999834	894195	1105804	0	105970 000165

	Sine Comple.	Sine Comple.	Tang. Comple.	Tang. Comple.	com. ar. com. of sine of f.
1	894029	999834	894195	1105804	60 105970 00016
2	894173	999833	894340	110565959	105826 00016
3	894317	999832	894485	110551458	105682 00016
4	894460	999831	894629	110537057	105539 00016
5	894603	999829	894773	110522656	105396 00016
6	894745	999828	894916	110508355	105254 00016
7	894887	999827	895059	110494054	105114 00016
8	895028	999826	895202	110479753	104971 00016
9	895169	999825	895344	110465552	104830 00016
10	895309	999824	895485	110451451	104690 00016
11	895449	999823	895626	110437350	104550 00016
12	895589	999822	895767	110423249	104410 00016
13	895728	999820	895907	110409248	104271 00016
14	895867	999819	896047	110395247	104132 00016
15	896005	999818	896186	110381346	103994 00016
16	896142	999817	896325	110367445	103857 00016
17	896280	999816	896463	110353644	103719 00016
18	896416	999815	896601	110339843	103583 00016
19	896553	999813	896739	110326042	103446 00016
20	896689	999812	896876	110312341	103310 00016
21	896824	999811	897012	110298640	103175 00016
22	896959	999810	897149	110285939	103040 00016
23	897094	999809	897285	110271438	102905 00016
24	897228	999808	897420	110257937	102771 00016
25	897362	999806	897555	110244436	102637 00016
26	897496	999805	897690	110230935	102503 00016
27	897629	999804	897824	110217534	102370 00016
28	897761	999803	897958	110204133	102238 00016
29	897894	999802	898092	110190732	102105 00016
30	898025	999800	898225	110177431	101974 00016
	Sine Comple.	Sine Comple.	Tang. Comple.	Tang. Comple.	84

	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
0	898157	999799	898357	1101642	301842 000200
1	898288	999798	898489	1101510	201711 000201
2	898418	999797	898621	1101378	28101581 000202
3	898519	999795	98753	1101246	37101450 000204
4	898678	999794	89884	1101115	26101321 000205
5	898808	999793	99014	1120985	25101191 000206
6	898937	999792	99145	1100854	24101062 000207
7	899066	999790	899275	1100724	23100933 000209
8	899194	999789	99404	1100595	22100805 000210
9	899322	999788	899533	1100466	21100677 000211
10	899449	999787	899662	1100337	20100550 000212
11	899576	999785	99790	1100209	19100423 000214
12	899703	999784	89991	1100081	18100396 000215
13	899829	999783	900046	1099953	17100170 000216
14	899955	999782	900173	1099826	16100044 000217
15	900081	999780	900300	1049699	15099918 000219
16	900206	999779	900427	1099572	14099793 000220
17	900331	999778	900553	1099446	13099668 000221
18	900456	999777	900679	1099320	12099543 000223
19	900580	999775	900804	1099195	11099419 000224
20	900704	999774	900929	1099070	10099295 000225
21	900827	999773	901054	1098945	9099172 000226
22	900950	999771	901179	1098820	8099049 000228
23	901073	999770	901303	1098696	7098926 000229
24	901196	999769	901426	1098573	6098803 000230
25	901318	999768	901550	1098449	5098681 000231
26	901439	999766	901673	1098326	4098560 000233
27	901561	999765	901795	1098204	3098436 000234
28	901682	999764	901918	1098081	2098317 000235
29	901803	999762	902040	1097959	1098196 000237
30	901923	999761	902162	1097837	0098076 000238

Sine
comple. | Sine. | Tangent
comple. | Tang. | 84

6	Sine comple.	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of sine.	com. ar. of sine.	6
0	901923	999761	902162	1097337	60 098076	00023	30
1	902045	999760	902283	1097716	59 097956	00023	31
2	902163	999758	902404	1097595	58 097836	00023	32
3	902282	999757	902525	1097474	57 097717	00023	33
4	902401	999756	903645	1097354	56 097598	00024	34
5	902520	999754	902765	1097234	55 097479	00024	35
6	902638	999753	902885	1097114	54 097361	00024	36
7	902756	999752	903004	1096995	53 097243	00024	37
8	902874	999750	903123	1096876	52 097125	00024	38
9	902991	999749	903242	1096757	51 097008	00025	39
10	903108	999747	903363	1096639	50 096891	00025	40
11	903225	999746	903479	1096520	49 096774	00025	41
12	903342	999745	903596	1096403	48 096657	00025	42
13	903458	999743	903714	1096285	47 096541	00025	43
14	903574	999742	903831	1096168	46 096425	00025	44
15	903689	999741	903948	1096051	45 096310	00025	45
16	903804	999739	904065	1095934	44 096195	00026	46
17	903919	999738	904181	1095819	43 096080	00026	47
18	904034	999736	904297	1095702	42 095965	00026	48
19	904148	999735	904412	1095587	41 095851	00026	49
20	904262	99973	904528	1095471	40 095737	00026	50
21	904376	999732	904643	1095356	39 095623	00026	51
22	904489	999731	904758	1095241	38 095510	00026	52
23	904602	999729	904872	1095127	37 095397	00027	53
24	904715	999728	904986	1095013	36 095284	00027	54
25	904827	999727	905100	1094899	35 095172	00027	55
26	904940	999725	905214	1094785	34 095059	00027	56
27	905051	999724	905327	1094672	33 094948	00027	57
28	905163	999722	905440	1094559	32 094836	00027	58
29	905274	999721	905553	1094446	31 094725	00027	59
30	905385	999719	905665	1094334	30 094614	00028	60
	Sine comple.	Sine.	Tangent comple.	Tang.	83		

Sine.	Sine comple.	Tang.	Tangent comple.	com. ar. com. ar. of Sine. of si. co.
30905285	999719905665	1094334	3094614	000280
31905496	999718905778	1094223	29094503	000281
32905607	999717905890	109410928	094392	000282
33905717	999715906001	1093998	17094282	000284
34905827	999714906112	1093887	26094172	000285
35905936	999712906224	1093775	25094063	000287
36906046	999711906334	1093665	24093953	000288
37906155	999709906445	1093554	23093844	000290
38906263	999708906555	1093444	22093736	000291
39906372	999706906665	1093334	21093627	000293
40906480	999705906775	1093224	20093519	000294
41906588	999703906884	1093115	19093411	000296
42906696	999702906993	1093006	18093303	000297
43906803	999700907102	1092897	17093196	000299
44906910	999699907211	1092788	16093089	000300
45907017	999697907319	1092680	15092982	000302
46907124	999696907427	1092572	14092875	000303
47907230	999694907535	1092464	13092769	000305
48907336	999693907643	1092356	12092663	000306
49907442	999691907750	1092249	11092557	000308
50907547	999690907857	1092142	10092452	000309
51907653	999688907964	1092035	9092346	000311
52907758	999687908070	1091929	8092241	000312
53907863	999685908177	1091822	7092136	000314
54907967	999684908283	1091716	6092032	000315
55908071	999682908389	1091610	5091928	000317
56908175	999681908494	1091505	4091824	000318
57908279	999679908599	1091400	3091720	000320
58908383	999678908705	1091294	2091616	000321
59908486	999676908809	1091190	1091513	000323
60908589	999675908914	1091085	0091410	000324

Sine | Sine | Tangent | Tang. | 83
comple. | comple. | comple.

7 Sine.	Sine Comple.	Tang.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Si. co.
0908579	999635	908914	1091085	60091410	000324
1908692	999673	909018	1090981	59091307	000326
2908794	999671	909122	1090877	58091205	000328
3908897	999670	909236	1090773	57091103	000329
4908999	999668	909330	1090669	56091000	000331
5909100	999667	909433	1090566	55090899	000332
6909202	999665	909536	1090463	54090797	000334
7909303	999664	909639	1090360	53090696	000335
8909404	999662	909742	1090257	52090595	000337
9909505	999660	909844	1090155	51090494	000339
10909606	999659	909946	1090053	50090393	000340
11909706	999657	910048	1089951	49090293	000342
12909806	999656	910150	1089849	48090193	000343
13909906	999654	910251	1089748	47090093	000345
14910006	999652	910353	1089646	46089993	000347
15910105	999651	910454	1089545	45089894	000348
16910204	999649	910555	1089445	44089795	000350
17910303	999648	910655	1089344	43089696	000351
18910402	999646	910755	1089244	42089597	000353
19910500	999644	910856	1089143	41089499	000355
20910599	999643	910955	1089044	40089400	000356
21910697	999641	911055	1088944	39089302	000358
22910795	999640	911155	1088844	38089204	000359
23910892	999638	911254	1088645	37089107	000361
24910990	999636	911353	1088646	36089009	000363
25911087	999635	911452	1088547	35088912	000364
26911184	999633	911550	1088449	34088815	000366
27911280	999631	911649	1088350	33088719	000368
28911377	999630	911747	1088252	32088622	000369
29911473	999528	911845	1088154	31088526	000371
30911569	999626	911942	1088057	30088430	000372

	Sine	Sine compl.	Tang.	Tangent compl.	com. ar. of Sine.	com. ar. of fi. co.
0324	309111569	999626	911942	10880571	30058430	000373
0326	319111665	999625	912040	1087959	29088334	000374
0328	329111761	999623	912137	1087862	28088238	000376
0329	339111856	999621	912234	1087765	27088143	000378
0331	349111951	999620	912331	1087668	26088048	000379
0332	35912046	999618	912428	1087571	25087953	000381
0334	36912141	999616	912524	1087475	24087858	000383
0335	37912236	999615	912621	1087378	23087763	000384
0337	38912330	999613	912717	1087282	22087669	000386
0339	39912424	999611	912813	1087136	21087575	000388
0340	40912518	999610	912908	1087091	20087481	000389
0342	41912612	999608	913004	108695	19087387	000391
0343	42912706	999606	913099	1086900	18087294	000393
0345	43912799	999604	913194	1086805	17087200	000395
0347	44912892	999603	913289	1086710	16087107	000396
0348	45912985	999601	913383	1086616	15087014	000398
0350	46913078	999599	913478	1086521	14086921	000400
0351	47913170	999598	913572	1086427	13086829	000401
0353	48913262	999596	913666	1086333	12086737	000403
0355	49913355	999594	913760	1086239	11086644	000405
0356	50913447	999592	913854	1086145	10086552	000407
0358	51913538	999591	913947	1086052	9086461	000408
0359	52913630	999589	914040	1085959	8086369	000410
0361	53913721	999587	914134	1085866	7086278	000412
0363	54913812	999585	914226	1085773	6086187	000414
0364	55913903	999584	914319	1085680	5086096	000415
0366	56913994	999582	914412	1085587	4086005	000417
0368	57914085	999580	914504	1085495	3085914	000419
0369	58914175	999578	914598	1085403	2085824	000421
0371	59914265	999577	914686	1085311	1085734	000422
0373	60914355	999575	914780	1085219	0085644	000424

Sine
compl. | Sine. | Tangent
compl. | Tang. 83

Sine.	Sine Comple.	Tang.	Tangent Complem.	com. ar. of sine	com. ar. of f. co.
0 914355	999575	914780	1085219	60 085644	000424
1 914445	999573	914871	1085128	59 085554	000426
2 914534	999571	914963	1085036	58 085465	000428
3 914624	999569	915054	1084945	57 085375	000430
4 914713	999568	615145	1084854	56 085286	000432
5 914802	999566	915236	1084763	55 085197	000433
6 914891	999564	915326	1084673	54 085108	000435
7 914980	999562	915417	1084582	53 085019	000437
8 915068	999560	915507	1084492	52 084931	000439
9 915156	999559	615597	1084402	51 084843	000440
10 915245	999557	915687	1084312	50 084754	000442
11 915333	999555	915777	1084222	49 084666	000444
12 915420	999553	905867	1084132	48 084579	000446
13 915508	999551	915956	1084043	47 084491	000448
14 915595	999550	916045	1083954	46 084404	000449
15 915682	999548	916134	1083865	45 084317	000451
16 915770	999546	916223	1083776	44 084230	000453
17 915856	999544	916312	1083687	43 084143	000455
18 915943	999542	916400	1083599	42 084056	000457
19 916030	999540	916489	1083510	41 083969	000459
20 916116	999539	916577	1083422	40 083883	000460
21 916202	999537	916665	1083334	39 083797	000462
22 916288	999535	916753	1083246	38 083711	000464
23 916374	999533	916849	1083159	37 083625	000466
24 916459	999531	616929	1083071	36 083540	000468
25 916545	999529	917015	1082984	35 083454	000470
26 916630	999527	917102	1082897	34 083369	000472
27 916715	999525	917189	1082810	33 083284	000474
28 616800	999524	917276	1082723	32 083199	000475
29 916885	999522	917363	1082636	31 083114	000477
30 916970	999520	617449	1082550	30 083029	000479

Sine.
Comple.

Sine.
Comple.

Tang.
Complem.

Tang.
Complem.

81

8	Sine.	Sine Compl.	Tang.	Tangent Compl.	Com. ar. of sine	Com. ar. of Si. co.
30	916970	999520	917449	1082550	30	083029000479
31	917054	999518	917536	1082463	29	082945000481
32	917138	999516	917622	1082377	28	082861000483
33	917223	999514	917708	1082291	27	082776000485
34	917306	999512	917794	1082205	26	082693000487
35	917390	999510	917879	1082120	25	082609000489
36	917474	999508	917965	1082034	24	082525000491
37	917557	999507	918050	1081949	23	082442000492
38	917641	999505	918136	1081863	22	082358000494
39	917724	999503	918221	1081778	21	082275000496
40	917807	999501	918305	1081694	20	082192000498
41	917890	999499	918390	1081609	19	082109000500
42	917972	999497	918475	1081524	18	082027000502
43	918055	999495	918559	1081440	17	081944000504
44	918137	999493	918643	1081356	16	081862000506
45	918219	999491	918728	1081271	15	081780000508
46	918301	999489	918811	1081188	14	081698000510
47	918383	999487	918895	1081104	13	081616000512
48	918465	999485	918979	1081020	12	081534000514
49	918546	999483	919062	1080937	11	081453000516
50	918628	999481	919146	1080853	10	081371000518
51	918709	999479	919229	1080770	9	081290000520
52	918790	999477	919312	1080687	8	081209000522
53	918871	999475	919395	1080604	7	081128000524
54	918951	999473	919478	1080521	6	081048000526
55	919032	999471	919560	1080439	5	080967000528
56	919112	999469	919643	1080356	4	080887000530
57	919193	999467	919725	1080274	3	080806000532
58	919273	999465	919807	1080192	2	080726000534
59	919353	999463	919889	1080110	1	080646000535
60	919433	999461	919971	1080028	0	080566000538

Sine Compl. | Sine Compl. | Tangent Compl. | Tang. | 81

Sine	Sine compl.	Tang.	Tangent compl.	Com. ar. of sine	Com. ar. of Si. co.
0 91943 399946	1 91997 108002860	0 080566	000538		
1 91951 2999459	920052 107994759	0 080487	000540		
2 91959 2999457	920134 107986538	0 080464	000541		
3 91967 1999455	920215 107978457	0 080328	000544		
4 91975 1999453	920297 107970256	0 080248	000546		
5 91983 0999451	920378 107962155	0 080169	000548		
6 91990 999449	920459 107954054	0 080090	000550		
7 91998 7999447	920540 107945953	0 080012	000552		
8 92006 6999445	920620 107937952	0 079933	000554		
9 92014 5999443	920701 107929851	0 079854	000556		
10 92022 3999441	920781 107921850	0 079776	000558		
11 92030 1999439	920861 107913849	0 079686	000560		
12 92037 999437	920942 107905748	0 079620	000561		
13 92045 7999435	921022 107897847	0 079542	000564		
14 92053 5999433	921101 107889846	0 079464	000566		
15 92061 3999431	921181 107881845	0 079384	000568		
16 92069 0999429	921261 107873844	0 079309	000570		
17 92076 7999427	921340 107865943	0 079232	000572		
18 92084 5999425	921419 107858042	0 079154	000574		
19 92092 3999423	921498 107850141	0 079077	000576		
20 92099 999421	921577 107842240	0 079000	000578		
21 92107 5999419	921656 107834339	0 078924	000580		
22 92115 2999417	921735 107816438	0 078847	000581		
23 92122 999414	921814 107818537	0 078770	000585		
24 92130 999412	921892 107810736	0 078694	000587		
25 92138 1999410	921970 107802935	0 078618	000589		
26 92145 7999408	922049 107795034	0 078542	000591		
27 92153 3999406	922127 107787233	0 078466	000593		
28 92160 999404	922205 107779432	0 078390	000595		
29 92168 5999402	922282 107771731	0 078314	000597		
30 92176 0999400	922360 107763930	0 078239	000599		
Sine compl.	Sine compl.	Tang. compl.	Tang. compl.	80	

	Sine comple.	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of si. co.
30	921760	999407	922360	1077639	3078229	000599
31	921836	999398	922438	1077561	29078163	000601
32	921911	999396	922515	1077484	28078088	000603
33	921988	999393	922592	1077407	27078013	000606
34	922061	999391	922670	1077329	26077938	000608
35	922136	999389	922747	1077252	25077863	000610
36	922211	999387	922823	1077176	24077788	000612
37	922286	999385	922900	1077099	23077713	000614
38	922360	999383	922977	1077022	22077639	000616
39	922434	999361	923053	1076946	21077565	000618
40	922509	999378	923130	1076869	20077490	000621
41	922583	999376	923205	1076793	19077416	000623
42	922657	999374	923282	1076717	18077342	000625
43	922731	999372	923358	1076641	17077268	000627
44	922804	999370	923434	1076565	16077195	000629
45	922878	999368	923510	1076489	15077121	000631
46	922951	999365	923585	1076414	14077048	000634
47	923025	999363	923661	1076338	13076974	000636
48	923098	999361	923736	1076263	12076901	000638
49	923171	999359	923812	1076187	11076828	000640
50	923244	999357	923887	1076112	10076755	000642
51	923317	999355	923962	1076037	9076681	000644
52	923389	999352	924037	1075962	8076610	000647
53	923462	999350	924111	1075888	7076537	000649
54	923534	999348	924186	1075813	6076465	000651
55	923607	999346	924261	1075738	5076392	000653
56	923679	999344	924335	1075664	4076320	000655
57	923751	999341	924409	1075590	3076248	000658
58	923823	999339	924483	1075516	2076176	000660
59	923895	999337	924557	1075442	1076104	000662
60	923967	999335	924631	1075368	0076032	000664

Sine
comple. Sine. Tang.
comple. Tang. 80

10	Sine.	Sine Comple.	Tang.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si. co.
0	923967	999335	924631	1075368	60 076032	000664
1	924038	999332	924705	1075294	59 075961	000667
2	924110	999330	924779	1075220	58 075889	000669
3	924181	999328	924852	1075147	57 075818	000671
4	924252	999326	924926	1075073	56 075747	000673
5	924323	999323	924999	1075000	55 075676	000675
6	924394	999321	925073	1074936	54 075605	000678
7	924465	999319	925146	1074853	53 075534	000680
8	924536	999317	925219	1074780	52 075463	000682
9	924606	999314	925292	1074708	51 075393	000685
10	924677	999312	925364	1074635	50 075322	000687
11	924747	999310	925437	1074562	49 075252	000689
12	924818	999308	925509	1074490	48 075181	000691
13	924888	999305	925582	1074417	47 075111	000694
14	924958	999303	925654	1074345	46 075041	000696
15	925028	999301	925726	1074273	45 074971	000698
16	925098	999299	925799	1074200	44 074901	000700
17	925167	999296	925870	1074129	43 074832	000703
18	925237	999294	925942	1074057	42 074762	000705
19	925306	999292	926014	1073985	41 074693	000707
20	925376	999289	926086	1073913	40 074622	000710
21	925445	999287	926157	1073842	39 074554	000712
22	925514	999285	926229	1073770	38 074485	000714
23	925583	999282	926300	1073699	37 074416	000717
24	925652	999280	926371	1073628	36 074347	000719
25	925721	999278	926442	1073557	35 074278	000721
26	925789	999275	926513	1073486	34 094210	000724
27	925858	999273	926584	1073415	33 074141	000726
28	925926	999271	926655	1073344	32 074073	000728
29	925995	999268	926726	1073273	31 074004	000731
30	926063	999266	926796	1073203	30 073936	000733
	Sine Comple.	Sine.	Tang. Complem.	Tang.	79	

	Sine Comple.	Tang. Comple.	Tang. Comple.	Com. ar. of Sine.	Com. ar. of Sine. & co.
664	926063	999266	926796	1073203	30 073926 000733
667	926131	999264	926867	1073132	29 073868 000735
669	926199	999261	926937	1073062	28 073800 000738
671	926267	999259	927007	1072992	27 073732 000740
673	926335	999257	927077	1072922	26 073664 000742
676	926402	999254	927147	1072852	25 073597 000745
678	926470	999253	927217	1072782	24 073529 000747
680	926537	999250	927287	1072712	23 073462 000749
682	926605	999247	927357	1072642	22 073394 000752
685	926672	999245	927426	1072553	21 073327 000754
687	926739	999242	927496	1072503	20 073260 000756
689	926806	999240	927565	1072434	19 073193 000759
691	926873	999238	927635	1072364	18 073126 000761
694	926940	999235	927704	1072295	17 073059 000764
696	927006	999233	927773	1072226	16 072993 000766
698	927073	999231	927842	1072157	15 072926 000768
700	927139	999228	927911	1072088	14 072860 000771
703	927206	999226	927980	1072019	13 072793 000773
705	927272	999223	928048	1071951	12 072727 000776
707	927338	999221	928117	1071882	11 072661 000778
709	927404	999219	928185	1071814	10 072595 000780
712	927470	999216	928254	1071745	9 072529 000783
714	927536	999214	928322	1071677	8 072463 000785
717	927602	999211	928390	1071609	7 072397 000788
719	927668	999209	928458	1071541	6 072331 000790
721	927733	999206	928526	1071473	5 072266 000793
724	927799	999204	928594	1071405	4 072200 000795
726	927864	999202	928662	1071337	3 072135 000797
728	927929	999199	928730	1071269	2 072070 000800
730	927994	999197	928797	1071202	1 072005 000801
732	928059	999194	928869	1071134	0 071940 000805
	Sine Comple.	Sine. Comple.	Tangent Complem.	Tang.	79

	Sine Comple.	Sine Comple.	Tang. Comple.	Tang. Comple.	com. ar. com. a. of sine of sine
1	928059	999194	928865	1071134	6007194000080
2	928124	999192	928932	1071067	5907181000082
3	928189	999189	928999	1071000	5807187500081
4	928254	999187	929067	1070932	5707174500081
5	928319	999184	929134	1070865	5607168000081
6	928383	999182	929201	1070798	5507161600081
7	928448	999179	929268	1070731	5407155100081
8	928511	999177	929335	1070665	5307148400081
9	928576	999174	929401	1070598	5207143300081
10	928640	999172	929468	1070531	5107135900081
11	928704	999169	929534	1070465	5007129500081
12	928768	999167	929601	1070398	4907123100081
13	928832	999164	929567	1070332	4807116700081
14	928896	999162	929733	1070266	4707110300081
15	928960	999159	929800	1070199	4607103900084
16	929022	999157	929866	1070133	4507097600084
17	929087	999154	929932	1070067	4407091200084
18	929150	999152	92998	1070001	4307084500084
19	929213	999149	930063	1069936	4207078600085
20	929276	999147	930129	1069870	4107072300085
21	929339	999144	930195	1069804	4007066000085
22	929402	999142	930260	1069739	3907059700085
23	929465	999139	930326	1069673	38070534000860
24	929528	999137	930391	1069608	37070471000861
25	929591	999134	930456	1069543	36070408000861
26	929653	999132	930521	1069478	35070346000861
27	929716	999129	930586	1069413	34070283000870
28	929778	999126	930651	1069348	33070221000873
29	929841	999124	930716	1069283	32070158000875
30	929903	999121	930781	1069213	31070096000878
	Sine Comple.	Sine Comple.	Tang. Comple.	Tang.	78

m.	a.	Sine comple.	Sine comple.	Tang.	Tangent comple.	com. ar. of sine.	com. ar. of sine.
0	929964	999119	930846	1069052	30070034	000880	
1	930027	999116	930910	1069289	29069972	000883	
2	930089	999114	930975	1069024	28069910	000885	
3	930151	999111	931039	1068960	27069848	000888	
4	930213	999108	931104	1068895	26069786	000891	
5	930274	999106	931168	1068831	25069725	000853	
6	930336	999103	931232	1068767	24069663	000896	
7	930397	999101	931296	1068703	23069602	000898	
8	930459	999098	931360	1068639	22069540	000901	
9	930520	999095	931424	1068575	21069479	000904	
10	930581	999093	931488	1068511	20069418	000906	
11	930643	999091	931552	1068447	19069356	000909	
12	930704	999088	931615	1068384	18069295	000911	
13	930765	999085	931679	1068320	17069234	000914	
14	930825	999081	931742	1068257	16069174	000917	
15	930886	999080	931806	1068193	15069113	000919	
16	930947	999077	931869	1068130	14069052	000922	
17	930007	999075	931932	1068067	13068992	000924	
18	930068	999072	931996	1068003	12068931	000927	
19	930128	999069	932059	1067947	11068871	000930	
20	930189	999067	932122	1067877	10068810	000932	
21	930249	999064	932185	1067814	9068750	000935	
22	930309	999061	932247	1067752	8068690	000938	
23	930369	999059	932310	1067689	7068630	000940	
24	930429	999056	932373	1067626	6068570	000943	
25	930489	999053	932435	1067564	5068510	000945	
26	930549	999051	932498	1067501	4068450	000948	
27	930609	999048	932560	1067439	3068390	000951	
28	930668	999045	932623	1067376	2068331	000954	
29	930728	999043	932685	1067314	1068271	000956	
30	930787	999040	932747	1067252	0068212	000959	
		Sine Comple.	Sine.	Tangent Complem.	Tang.	81	

12. Sine.	Sine Comple.	Tang.	Tangent Comple.	Com. ar.	Com. ar. of Sine. of Sine.
0931787	999040	932747	1067252	69068212	00099
1931847	999037	932809	1067190	59068152	00096
2931906	999035	932871	1067128	58068093	00096
3931965	999032	932933	1067066	57068034	00096
4932024	999029	932995	1067004	56067975	00097
5932084	999026	933057	1066942	55067916	00097
6932142	999024	933118	1066881	54067857	00097
7932201	999021	933180	1066819	53067798	00097
8932260	999018	933241	1066758	52067739	00098
9932319	999016	933303	1066696	51067680	00098
10932378	999013	933364	1066635	50067621	00098
11932436	999010	933425	1066574	49067563	00098
12932495	999007	933487	1066512	48067504	00099
13932553	999005	933548	1066451	47067446	00099
14932611	999002	933609	1066390	46067388	00099
15932669	998999	933670	1066329	45067330	00100
16932728	998996	933731	1066268	44067271	00100
17932786	998994	933791	1066208	43067213	00100
18932844	998991	933853	1066147	42067155	00100
19932902	998988	933913	1066086	41067097	00101
20922959	998985	933973	1066026	40067040	00101
21933017	998983	934034	1065965	39066982	00101
22933075	998980	934094	1065905	38066924	00101
23933132	998977	934155	1065844	37066867	00101
24933190	998974	934215	1065784	36066809	00102
25933247	998972	934275	1065724	35066752	00102
26933305	998969	934335	1065664	34066694	00103
27933362	998966	934395	1065604	33066637	00103
28933419	998963	934455	1065544	3206658000	00103
29933476	998960	934513	1065484	3106652300	00103
30933533	998958	934575	1065424	3006646600	00104
Sine Comple.		Sine.	Tangent Comple.	Tang.	77

com. of sin.	8 Sine complete.	Sine complete.	Tang. complete.	Tangent complete.	com. ar. of sine.	com. ar. of sin.co.
00096	0	933533	998958	934575	1065424	30066466001041
00096	1	933506	998955	934635	1065364	29066409001044
00096	2	933647	998952	934694	1065305	28066352001047
00097	3	933704	998949	934754	1065245	27066295001050
00097	4	633760	998944	934814	1065185	26066239001053
00097	5	923817	998944	924873	1065126	25066182001055
00097	6	933874	998941	934932	1065067	24066125001058
00098	7	933930	998938	934992	1065007	23066069001061
00098	8	933987	998935	935051	1064948	22066012001064
00098	9	934043	998932	935110	1064889	21065956001067
00098	40	924099	998929	935169	1064820	20065900001070
00099	41	934155	998927	935228	1064771	19065844001072
00099	42	934211	998924	935287	1064712	18065788001075
00099	43	934267	998921	935346	1064653	17065732001078
00099	44	934323	998918	935405	1064594	16065676001081
00099	45	934379	998915	935464	1064535	15065620001084
00099	46	934435	998913	935522	1064477	14065564001087
00099	47	934491	998909	935581	1064418	13065508001090
00099	48	934546	998907	935639	1064360	12065453001092
00099	49	934603	998904	935698	10643111065397	001095
00099	50	934657	998901	935756	1064243	10065342001098
00099	51	934713	998898	935814	1064185	9065286001101
00099	52	934768	998895	935873	1064136	8065231001104
00099	53	934823	998892	935931	1064068	7065176001107
00099	54	934879	998889	935989	1064010	6065120001112
00099	55	934934	998886	936047	1063952	5065065001113
00099	56	934989	998884	936105	1063894	4065010001115
00099	57	935044	998881	936163	1063836	3064955001118
00099	58	935099	998878	936221	1063779	2064900001121
00099	59	935154	998875	936278	1063721	1064845001124
00099	60	924208	998872	936336	1063663	0064791001127
		Sine complete.	Sine complete.	Tang. complete.	Tang.	77

Sine	Sine	Tang.	Tangent	Com. ar.	Com.	3
Comple.	Comple.	Comple.	Comple.	of Sine.	of Sine.	S
0 935208	998872	936236	1063663	60	064791	00110
1 935263	998869	936394	1063605	54	064736	00111
2 935318	998866	936451	1063548	58	064683	00112
3 935372	998863	936509	1063490	57	064627	00113
4 935427	998860	936566	1063433	56	064572	00114
5 935481	998857	936623	1063376	55	064518	00115
6 935535	998854	936681	1063219	54	064464	00116
7 935590	998851	936738	1063261	53	064409	00117
8 935644	998848	936795	1063204	52	064357	00118
9 935698	998845	936852	1063147	51	064303	00119
10 935752	998843	936909	1063090	50	064247	00119
11 935806	998840	936966	1063033	49	064193	00119
12 935860	998837	937023	1062976	48	064139	00116
13 935914	998834	937079	1062920	47	064085	00116
14 935967	998831	937136	1062863	46	064032	00116
15 036021	998828	937193	1062806	45	063973	00117
16 936075	998825	937249	1062750	44	063924	00117
17 936128	998822	937306	1062693	43	063871	00117
18 936182	998819	937362	1062637	42	063817	00118
19 936235	998816	937419	1062580	41	063764	00118
20 936288	998813	937475	1062524	40	063711	00118
21 936342	998810	937531	1062468	39	063657	00118
22 936395	998807	937588	1062411	38	063604	00119
23 936448	998804	937644	1062355	37	063551	00119
24 936501	998801	937700	1062299	36	063498	00119
25 936554	998798	937756	1062240	35	063445	00120
26 936607	998795	937812	1062187	34	063392	00120
27 936660	998792	937868	1062131	33	063329	00120
28 936713	998789	937923	1062076	32	063286	00121
29 936765	998786	937979	1062020	31	063234	00121
30 936818	998783	938035	1061964	30	063121	00121
	Sine Comple.	Sine Comple.	Tang. Comple.	Tang.	79	

Sine	Comple.	Tang.	Tangent	Com. ar.	Com. ar.
Sine		Comple.		of Sine.	of St. co.
0936818	998783	938035	1061964	30063181	001216
1936871	998780	938091	1061909	29063128	001219
2936923	998777	938146	1061813	28063076	001222
3936976	998774	938202	1061797	27063023	001225
4937028	998770	938257	1061742	29062971	001229
5937080	998767	938312	1061687	25062919	001232
6937133	998764	938368	1061631	14062866	001235
7937185	998761	938423	1061576	23062814	001238
8937237	998758	938478	1061521	22062762	001241
3937289	998755	938532	1061466	21062710	001244
40937341	998752	938588	1061411	20062658	001247
41937393	998749	938643	1061356	19062606	001250
42937445	998746	938698	1061301	18062554	001253
43937496	998743	938753	1061246	17062503	001256
44937548	998740	938808	1061191	16062451	001259
45937600	998737	938863	1061136	15062399	001262
46937651	998734	938917	1061082	14062348	001265
47937703	998731	938972	1061027	13062298	001268
48937754	998727	939027	1060973	12062245	001272
49937806	998724	939081	1060918	11062193	001275
50937857	998721	939135	1060864	10062142	001278
51937908	998718	939190	1060809	9062091	001281
52937960	998715	939244	1060755	80620390	001284
53938011	998712	939298	1060701	70619880	001287
54938062	998709	939355	1060644	60619370	001290
55938113	998706	939407	1060592	50618860	001293
56938164	998702	939461	1060538	40618350	001297
57938215	998699	939515	1060484	30617840	001300
58938266	998696	939569	1060430	20617330	001303
59938316	998693	939623	1060376	10616830	001305
60938367	998690	939677	1060322	00616320	001309

14. Sine.	Sine comple.	Tang.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. cu.
0 938367	998690	929673	1060322	60061632	00130
1 938418	998687	939730	1060369	59061581	00131
2 938468	998684	939784	1060215	58061531	00131
3 938519	998680	939838	1060161	57061480	00131
4 938569	998677	939891	1060108	56061430	00131
5 938620	998674	939945	1060054	55061379	00132
6 938670	998671	949998	1060001	54061329	00132
7 938720	998668	940053	1059947	53061279	00133
8 938770	998665	940105	1059894	52061229	00133
9 938821	998661	940159	1059840	51061178	00133
10 938871	998658	940212	1059787	50061128	00134
11 938921	998655	940265	1059734	49061078	00134
12 938971	998652	940318	1059681	48061028	00134
13 939020	998649	940371	1059628	47060979	00135
14 939070	998645	940424	1059575	46060929	00135
15 939120	998642	940477	1059522	45060879	00135
16 939170	998639	940530	1059469	44060829	00136
17 939219	998636	940583	1059416	43060780	00136
18 939269	998633	940636	1059363	42060730	00136
19 939319	998629	940689	10593104	41060680	00137
20 939368	998626	940741	1059258	40060631	00137
21 939417	998623	940794	1059205	39060582	00137
22 939467	998620	940847	1059152	38060532	00137
23 939516	998616	940899	1059100	37060483	00138
24 939565	998613	940952	1059047	36060434	00138
25 939614	998610	941004	1059995	35060385	00138
26 939664	998607	941056	1059943	34060335	00139
27 939713	998603	941109	1059890	33060286	00139
28 939762	998600	941161	1059838	32060237	00139
29 939811	998597	941213	1059786	31060188	00140
30 939859	998594	941265	1059734	30060140	00140

I4	Sine Comple.	Tang. Comple.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Si. co.
30	93985998594	9412651	1058734	30 060140	001409
31	939908998590	941317	1058682	29 060091	001409
32	939957998587	941369	1058630	28 060042	001411
33	940006998584	941421	1058578	27 059993	001412
34	940054998581	941473	1058526	26 059945	001418
35	940103998577	941525	1058474	25 059896	001422
36	940152998574	941577	1058422	24 059847	001425
37	940200998571	941629	1058370	23 059799	001428
38	940248998567	941680	1058319	22 059751	001432
39	940397998564	941732	1058167	21 059702	001435
40	940345998561	941784	1058215	20 059654	001438
41	940393998557	941835	1058164	19 059606	001442
42	940441998554	941887	1058112	18 059558	001445
43	940490998551	941938	1058061	17 059509	001448
44	940538998548	941990	1058009	16 059461	001451
45	940586998544	942041	1057958	15 059413	001455
46	940634998541	942092	1057907	14 059365	001458
47	940682998535	942143	1057856	13 059317	001461
48	9407299985349	942195	1057804	12 059270	001465
49	940777998531	942246	1057753	11 059222	001468
50	940825998528	942297	1057702	10 059174	001471
51	940873998524	942348	1057651	9 059126	001475
52	940920998521	942399	1057600	8 059079	001478
53	940968998517	942450	1057549	7 059031	001482
54	941015998514	942501	1057498	6 058984	001485
55	941063998511	942551	1057448	5 058936	001488
56	941110998507	942602	1057397	4 058889	001492
57	941115998504	942653	1057346	3 058842	001495
58	941205998501	942704	1057295	2 058794	001498
59	94125298497942754	942754	1057245	1 058747	001502
60	9412999984942805	942805	1057194	0 058700	001505

Sine Comple.	Sine. Comple.	Tangent Complem.	Tang.	75
-----------------	------------------	---------------------	-------	----

15	Sine. comple.	Sine. comple.	Tang. comple.	Tangent. comple.	com. ar. of sine.	com. w. of sine.
0	941299	998494	942805	1057194	60	058700
1	941346	998490	942855	1057144	59	058653
2	941393	998487	942906	1057093	58	058606
3	941440	998484	942956	1057043	57	058559
4	941487	998480	943006	1056993	56	058512
5	941534	998477	943057	1056942	55	058465
6	941581	998474	943107	1056892	54	058418
7	941628	998470	943157	1056842	53	058371
8	941675	998467	943207	1056792	52	058324
9	941721	998463	943257	1056742	51	058278
10	941768	998460	943308	1056691	50	058231
11	941814	998456	943358	1056641	49	058185
12	941861	998453	942408	1056592	48	058138
13	941907	998450	943457	1056542	47	058092
14	941954	998446	943507	1056492	46	058045
15	942000	998443	943557	1056442	45	05799900
16	942047	998439	943607	1056392	44	057952
17	942093	998436	943657	1056342	43	057906
18	942139	998432	943706	1056293	42	057861
19	942185	998429	943756	1056243	41	057814
20	942231	998425	943805	1056194	40	057768
21	942277	998422	943855	1056144	39	057722
22	942323	998418	943904	1056095	38	057676
23	942369	998415	943954	1056045	37	057630
24	942415	998412	944003	1055996	36	057584
25	942461	998408	944052	1055947	35	057538
26	942507	998405	944102	1055897	34	057492
27	942553	998401	944151	1055848	33	057447
28	942598	998398	944200	1055799	32	057401
29	942644	998394	944249	1055750	31	057355
30	942689	998391	944298	1055701	30	057210
	Sine Comple.	Sine. Comple.	Tangent. Complem.	Tang.	74	

	Sine Comple.	Tang.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si.co.
150	942689998391	944298	1055701	30057310001608	
150	942735998387	944347	1055652	29057264001612	
151	942780998384	944396	1055603	28057219001615	
151	942826998380	944445	1055554	27057173001619	
151	9428719983779	944494	1055505	26057128001622	
152	9429179983739	944543	1055456	25057082001626	
152	942962998369	944592	1055407	24057037001630	
152	943007998366	944641	1055358	23056992001633	
153	943052998362	944689	1055310	22056947001637	
153	943097998359	944728	1055261	21056902001640	
153	943142998355	944787	1055212	20056857001644	
154	943187998352	944835	1055164	19056812001647	
154	943232998348	944884	1055115	18056767001651	
154	943277998345	944932	1055067	17056722001654	
155	943322998341	944981	1055018	16056677001658	
155	943367998338	945029	1054970	15056633001661	
156	9434129983349	945077	1054922	14056587001665	
156	9434569983309	945126	1054873	13056547001669	
156	943501998327	945174	1054825	12056498001672	
157	943546998323	945222	1054777	11056453001676	
157	9435909983209	945270	1054729	10056409001679	
158	943635998316	945318	1054681	9056364001683	
158	943679998313	945366	1054633	8056320001686	
158	943724998309	945414	1054585	7056275001690	
158	943768998305	945462	1054537	6056231001694	
159	9438129983029	945510	1054489	5056187001697	
159	943857998298	945558	1054441	4056142001701	
159	943901998295	945606	1054393	3056098001704	
160	943945998293	945654	1054345	2056054001708	
160	943989998287	945701	1054298	1056010001712	
160	944033998284	945749	1054250	0055966001715	

Sine
Comple. | Sine. | Tangent
Complem. | Tang. | 74

16	Sine Comple.	Tang. Complem.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si.co.
0944023	998284	945749	1054290	60055966	001719
1944077	998280	945797	1054202	59055922	001719
2944121	998276	945844	1054155	58055878	001723
3944165	998273	945892	1054107	57055834	001726
4944209	998269	945940	1054059	56055790	001730
5944253	998266	945987	1054012	55055746	001734
6944297	998262	946034	1053965	54055702	001737
7944341	99825	946082	1053917	53055658	001741
8944384	998255	946129	1053870	52055615	001744
9944428	998251	946176	1053823	51055571	001748
10944471	998247	946224	1053775	50055528	001752
11944515	998244	946271	1053728	49055484	001755
12944559	998240	946318	1053681	48055440	001759
13944602	998236	946365	1053634	47055397	001763
14944645	998233	946412	1053587	46055354	001766
15944689	998229	946459	1053540	45055310	001770
16944732	998226	946506	1053493	44055267	001774
17944775	998222	946553	1053446	43055224	001777
18944819	998218	946600	10533994	42055180	001781
19944862	998214	946647	10533524	41055137	001785
20944905	998210	946694	10533054	40055094	001789
21944948	998207	946741	1053258	39055051	001793
22944991	998203	946788	1053211	38055008	001797
23945034	998199	946834	1053165	37054965	001801
24945077	998196	946881	1053118	36054922	001805
25945120	998192	946928	1053071	35054879	001809
26945163	998189	946974	1053025	34054836	001813
27945206	998184	947021	1053978	33054793	001817
28945248	998181	947067	1053932	32054751	001821
29945291	998177	947114	1053885	31054708	001825
30945334	998173	947160	1053839	30054665	001829

Sine
Comple.

Sine.

Tangent
Complem.

Tang. 73

16	Sine Comple.	Tang. Comple.	Tangent Comple.	com. ar. of sine	com. ar. of tangent
30	945334	998173	947160	1052839	30054665 001826
31	945376	998169	947206	1052793	29054623 001830
32	945419	998166	947253	1052746	28054580 001833
33	945461	998162	947299	1052700	27054538 001837
34	945504	998158	947345	1052654	26054405 001841
35	945546	998154	947391	1052608	25054453 001845
36	945589	998151	947438	1052561	24054410 001849
37	945631	998147	947484	1052515	23054368 001852
38	945673	998143	947530	1052469	22054326 001856
39	945716	998139	947576	1052423	21054283 001860
40	945758	998136	947622	1052377	20054241 001863
41	945800	998132	947668	1052331	19054199 001867
42	945842	998128	947714	1052285	18054157 001871
43	945884	998124	947760	1052239	17054115 001875
44	945926	998120	947805	1052194	16054073 001879
45	945968	998117	947851	1052148	15054031 001883
46	946010	998113	947897	1052102	14053989 001886
47	946052	998109	947943	1052056	13053947 001890
48	946094	998105	947988	1052011	12053905 001894
49	946136	998101	948034	1051965	11053863 001998
50	946178	998098	948080	1051919	10053821 002901
51	946219	998094	948125	1051874	9053780 002905
52	946261	998090	948171	1051828	8053738 002909
53	946303	998086	948216	1051783	7053696 002913
54	946344	998082	948262	1051737	6053655 002917
55	946386	998078	948307	1051692	5053613 002921
56	946427	998075	948352	1051647	4053572 002924
57	946469	998071	948398	1051601	3053530 002928
58	946510	998067	948443	1051556	2053489 002932
59	946552	998063	948488	1051511	1053447 002936
60	946593	998059	948533	1051466	0053406 002940

Sine
Comple. Sine. Tang.
Comple. Tang. 73

17	Sine Comple.	Tang. Comple.	Tangent Comple.	com. ar. of sine	com. ar. of si. co.
0	946592	998059	948533	1051466	60053406
1	946634	998055	948579	1051420	59053365
2	946676	998051	948624	1051375	58053323
3	946717	998048	948669	1051330	57053282
4	946758	998044	948714	1051285	56053241
5	946799	998040	948759	1051240	55053200
6	946840	998036	948804	1051195	54053159
7	946881	998032	948849	1051150	53053118
8	946922	998028	948894	1051105	52053077
9	946963	998024	948938	1051061	51053036
10	947004	998020	948983	1051016	50052995
11	947045	998016	949028	1050971	49052954
12	947086	998012	949073	1050926	48052913
13	947127	998009	949118	1050881	47052872
14	947167	998005	949162	1050837	46052832
15	947208	998001	949207	1050792	45052791
16	947249	997997	949251	1050748	44052750
17	947289	997993	949296	1050703	43052710
18	947330	997989	949340	1050659	42052669
19	947370	997985	949385	1050614	41052627
20	947411	997981	949429	1050570	40052588
21	947451	997977	949474	1050525	39052548
22	947492	997973	949518	1050481	38052507
23	947532	997969	949562	1050437	37052467
24	947573	997965	949607	1050392	36052426
25	947613	997961	949651	1050348	35052386
26	947653	997957	949695	1050304	34052346
27	947693	997953	949739	1050260	33052306
28	947733	997949	949784	1050215	32052266
29	947774	997945	949828	1050171	31052225
30	947814	997941	949873	1050127	30052185

Sine
Comple. Sine. Tang.
Complem. Tang. 72

17	Sine.	Sine Compl.	Tang.	Tangent Compl.	Com. ar. of sine	Com. ar. of Si. co.
30	947814	997941	949872	1050127	20	052185 002058
31	947854	997937	949916	1050083	29	052145 002062
32	947894	997933	949960	1050039	28	052105 002066
33	947934	997929	950004	1049995	27	052065 002070
34	947974	997925	950048	1049951	26	052025 002074
35	948014	997921	950092	1049907	25	051985 002078
36	948053	997917	950135	1049864	24	051946 002082
37	948093	957913	950179	1049829	23	051906 002086
38	948133	997909	950223	1049776	22	051866 002090
39	948173	997905	950267	1049732	21	051826 002094
40	948212	997901	950310	1049689	20	051787 002098
41	948252	997897	950354	1049645	19	051747 002102
42	948392	997893	950398	1049601	18	051707 002106
43	948331	997889	950441	1049558	17	051668 002110
44	948371	997885	950485	1049514	16	051628 002114
45	948410	997881	950528	1049471	15	051589 002118
46	948450	997877	950572	1049427	14	051549 002126
47	948489	997873	950615	1049384	13	051510 002122
48	948528	997869	950659	1049380	12	051471 002130
49	948568	997865	950702	1049297	11	051431 002134
50	948607	997861	950746	1049253	10	051392 002138
51	948646	997857	950789	1049210	9	051353 002142
52	948685	997853	950832	1049167	8	051314 002146
53	948725	997849	950875	1049124	7	051274 002150
54	948764	997845	950919	1049080	6	051235 002154
55	948803	997841	950963	1049037	5	051196 002158
56	948842	997837	951005	1048994	4	051157 002162
57	948881	997832	951048	1048951	3	051118 002167
58	948910	997828	951091	1048908	2	051079 002171
59	948959	997824	951134	1048865	1	051040 002175
60	948998	997820	951177	1048822	0	051001 002179
	Sine comple.	Sine	Tangent comple.	Tang.	72	

18	Sine.	Sine Compl.	Tang.	Tangent Compl.	Com. ar. of sine	Com. ar. of Si. co.
0	948998	997820951177	1048826	80051001	002179	09
1	949037	997816951220	1048779	59050962	002183	19
2	949075	997812951263	1048736	58050924	002187	29
3	949114	997808951306	1048693	57050885	002191	39
4	949153	997804951349	1048650	56050846	002195	49
5	949192	997800951392	1048607	55050307	002199	59
6	949230	997795951434	1048565	54050769	002204	69
7	949269	997791951477	1048522	53050730	002208	79
8	949308	997787951520	1048479	52050691	002212	89
9	949346	997783951563	1048436	51050653	002216	99
10	949385	997779951605	1048394	50050614	002220	99
11	949423	997775951648	1048351	49050576	002224	119
12	949461	997771951690	1048309	48050537	002228	129
13	949500	997760951733	1048266	47050499	002233	139
14	949538	997762951776	1048223	46050461	002237	149
15	949577	997758951818	1048181	45050422	002241	159
16	949611	997754951861	1048138	44050384	002245	169
17	949653	997750951903	1048096	43050346	002249	179
18	949691	997746951945	1048054	42050308	002253	189
19	949730	997741951983	1048011	41050269	002258	199
20	949763	997737952030	1047969	40050231	002262	209
21	949806	997733952072	1047927	39050193	002266	219
22	949844	997729952115	1047884	38050155	002270	229
23	949882	997725952157	1047842	37050117	002274	239
24	949920	997720952199	1047800	36050079	002279	249
25	949958	997716952241	1047758	35050041	002283	259
26	949996	997712952283	1047716	34050003	002287	269
27	940034	997708952325	1047674	33059965	002291	279
28	940072	997704952367	1047632	32059927	002295	289
29	940109	997699952409	1047590	31059890	002300	299
30	940147	997695952451	1047548	30059852	002304	309
	Sine compl.	Sine compl.	Tangent compl.	Tang.	71	

Sine. comple.	Sine comple.	Tang. comple.	Tangent comple.	com. ar. com. ar. of Sine. of fi. co.
950147	997695	952451	1047548	30 049852 002304
950185	997691	952493	1047506	29 049814 002308
950223	997687	952535	1047464	28 049476 002312
950260	997682	952577	1047422	27 049739 002317
950298	997678	952619	1047380	26 049701 002321
950335	997674	952661	1047338	25 049664 002325
950373	997670	952703	1047296	24 049626 002329
950411	997665	952745	1047254	23 049588 002334
950448	997661	952786	1047213	22 049551 002338
950485	997657	952828	1047171	21 049514 002342
950523	997653	952870	1047129	20 049476 002346
950560	997648	952911	1047088	19 049439 002351
950598	997644	952953	1047046	18 049401 002355
950635	997640	952995	1047004	17 049364 002359
950672	997636	953036	1046963	16 049327 002363
950709	997631	953078	1046921	15 049290 002368
950747	997627	953119	1046880	14 049252 002372
950784	997623	953161	1046838	13 049215 002376
950821	997618	953202	1046797	12 049178 002381
950858	997614	953243	1046756	11 049141 002385
950895	997610	953285	1046714	10 049104 002389
950932	997605	953326	1046673	9 049067 002394
950969	997601	953367	1046632	8 049030 002398
951006	997597	953409	1046590	7 048993 002402
951043	997593	953450	1046549	6 048956 002406
951080	997588	953491	1046508	5 048919 002411
951117	997584	953532	1046467	4 04882 002415
951153	997580	953573	1046426	3 048846 002419
951190	997575	953614	1046384	2 048809 002424
951227	997571	953656	1046343	1 048772 002428
951264	997567	953697	1046302	0 048735 002421

Sine
comple. | Sine. | Tangent
comple. | Tang. 71

19	Sine.	Sine comple.	Tang.	Tangent comple.	com. ar. 1000. ar. of Sine. of f. c.
0	951264	997567	953697	1046302	60 048735 002432
1	951300	997562	953738	1046261	59 048699 002437
2	951337	997558	953779	1046220	58 048662 002441
3	951374	997553	953820	1046179	57 048625 002445
4	951410	997549	953861	1046138	56 048589 002450
5	951447	997545	953902	1046098	55 048552 002454
6	951483	997540	953942	1046057	54 048516 002458
7	951520	997536	953983	1046016	53 048479 002463
8	951556	997532	954024	1045975	52 048443 002467
9	951593	997527	954065	1045934	51 048407 002471
10	951629	997523	954106	1045893	50 048370 002476
11	951665	997518	954145	1045853	49 048334 002481
12	951701	997514	954187	1045812	48 048298 002485
13	951738	997510	954228	1045771	47 048261 002489
14	951774	997505	954268	1045731	46 048225 002494
15	951810	997401	954309	1045690	45 048189 002498
16	951846	997496	954349	1045650	44 048153 002503
17	951882	997492	954390	1045609	43 048117 002507
18	951919	997488	954431	1045569	42 048080 002511
19	951955	997483	954471	1045528	41 048044 002516
20	951991	997479	954511	1045488	40 048008 002520
21	952027	997474	954552	1045447	39 047972 002525
22	952063	997470	954592	1045407	38 047936 002529
23	952098	997465	954633	1045366	37 048901 002534
24	952134	997461	954673	1045326	36 048865 002538
25	952170	997456	954713	1045286	35 048829 002543
26	952206	997452	954754	1045245	34 048793 002547
27	952242	997448	954794	1045205	33 048757 002551
28	952278	997443	954834	1045165	32 048721 002556
29	952313	997436	954874	1045125	31 048686 002560
30	952349	997434	954914	1045085	30 048650 002565
	Sine comple.	Sine,	Tangent comple.	Tang.	70

(43)

19	Sine. comple.	Sine comple.	Tang. comple.	Tangent comple.	comb. ar. of Sine.	comb. ar. of fi. co.
30	952249	997434	954914	1045085	30	047650 002565
31	952385	997430	954955	1045245	29	047614 002569
32	952420	997425	954995	1045004	28	047579 002574
33	952456	997421	954035	1044964	27	047543 002578
34	952491	997416	955075	1044924	26	047508 002583
35	952527	997412	955115	1044884	25	047472 002587
36	952562	997407	955155	1044844	24	047437 002592
37	952598	997403	955195	1044804	23	047401 002596
38	952633	997398	955235	1044764	22	047366 002601
39	952669	997394	955275	1044724	21	047330 002605
40	952704	997389	955314	1044685	20	047295 002610
41	952739	997385	955354	1044645	19	047260 002614
42	952775	997380	955394	1044605	18	047224 002619
43	952810	997376	955434	1044565	17	047189 002624
44	952845	997371	955474	1044525	16	047154 002628
45	952880	997367	955513	1044486	15	047119 002632
46	952916	997362	955553	1044446	14	047083 002637
47	952951	997358	955593	1044406	13	047048 002641
48	952986	997353	955633	1044367	12	047013 002645
49	953021	997348	955672	1044327	11	046978 002651
50	953056	997344	955712	1044287	10	046943 002655
51	953091	997339	955751	1044248	9	046908 002660
52	953126	997335	955791	1044208	8	046873 002664
53	953161	997330	955830	1044169	7	046838 002669
54	953196	997326	955870	1044129	6	046803 002673
55	953231	997221	955909	1044090	5	046768 002678
56	953266	997316	955949	1044050	4	046733 002683
57	953300	997312	955981	1044011	3	046699 002687
58	953335	997307	956027	1043972	2	046664 002692
59	953376	997303	956067	1043932	1	046629 002696
60	953405	997398	956106	1043890	0	046594 002601

Sine
comple. | Sine.
comple. | Tangent
comple. | Tang. 70

046603

	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of f. 10.
0	953405997298	956106	1043893	60046594	002701
1	953439997293	956145	1043854	59046560	002706
2	953474997289	956185	1043814	58046525	002710
3	953509997284	956224	1043775	57046490	002719
4	953543997280	956263	1043736	56046456	002715
5	953578997275	956302	1043697	55046421	002724
6	953612997270	956341	1043658	54046387	002729
7	953647997266	956381	1043618	53046352	002733
8	953681997261	956420	1043579	52046318	002738
9	953716997257	956459	1043540	51046283	002743
10	953750997252	956498	1043501	50046249	002747
11	953785997247	956537	1043462	49046214	002752
12	953819997243	956576	1043423	48046180	002756
13	953853997238	956615	1043384	47046146	002761
14	953888997233	956654	1043345	46046111	002766
15	953922997229	956693	1043306	45046077	002770
16	953956997224	956732	1043267	44046043	002775
17	953990997219	956770	1043229	43046009	002780
18	954024997215	956809	1043190	42045975	002784
19	954059997210	956848	1043151	41045940	002789
20	954093997205	956887	1043112	40045906	002794
21	954127997201	956926	1043073	39045872	002798
22	954161997196	956964	1043035	38045835	002802
23	954195997191	957003	1042996	37045804	002808
24	954229997187	957042	1042957	36045770	002812
25	954263997182	957080	1042919	35045736	002817
26	954297997177	957119	1042880	34045702	002822
27	954331997172	957158	1042841	33045668	002827
28	954364997168	957195	1042803	32045635	002831
29	954398997163	957235	1042764	31045601	002836
30	954432997158	957273	1042726	30045567	002841

20	Sine Comple.	Sine Comple.	Tang. Comple.	Tangent Comple.	Com. ay. of Sine.	Com. ay. of Sine.
30	954432	997158	957277	1042726	30.045567	002841
701						
706	31	954466	997154	957312	1042687	29.045533
710	32	954500	997149	957350	1042649	28.045499
719	33	954533	997144	957389	1042610	27.045466
715	34	954567	997139	957427	1042572	26.045433
724	35	954601	997135	957466	1042522	25.045398
729	36	954634	997130	957504	1042495	24.045365
733	37	954668	997125	957542	1042457	23.045332
738	38	954701	997120	957581	1042418	22.045293
741	39	954733	997116	957619	1042380	21.045264
747	40	954768	997111	957657	1042342	20.045231
752	41	954802	997106	957695	1042304	19.045197
756	42	954835	997101	957734	1042265	18.045164
761	43	954869	997097	957772	1042227	17.045130
766	44	954902	997092	957810	1042189	16.045097
770	45	954936	997087	957848	1042151	15.045063
775	46	954969	997082	957886	1042113	14.045039
780	47	955003	997077	957924	1042075	13.044997
784	48	955035	997073	957962	1042037	12.044964
789	49	955069	997068	958000	1041999	11.044930
794	50	955102	997063	958038	1041961	10.044897
798	51	955135	997058	958076	1041923	9.044864
803	52	955168	997053	958114	1041885	8.044831
808	53	955201	997049	958152	1041847	7.044798
812	54	955234	997044	958190	1041809	6.044765
817	55	955268	997039	958228	1041771	5.044731
821	56	955301	997034	958266	1041733	4.044698
827	57	955334	997029	958304	1041695	3.044665
831	58	955367	997024	958342	1041657	2.044632
836	59	955399	997020	958379	1041620	1.044600
841	60	955432	997015	958417	1041582	0.044567

Sine
Comple. | Sine
Comple. | Tangent
Comple. | Tang. | 69

Sine	Sine	Tangent	Com. ar.	com. et.
Comple.	Comple.	Comple.	of Sine.	of Sine.
1955432	997015	958417	1041582	60 044567 002984
1955465	997010	958455	1041544	57 044534 002989
2955498	997005	958493	1041506	58 044561 002994
3955531	997000	958530	1041469	57 044468 002999
4955564	996995	958568	1041431	56 044435 003004
5955597	996990	958606	1041292	55 044402 003009
6955629	996985	958643	1041356	54 0444370 003014
7955662	996981	958681	1041318	53 044337 003018
8955695	996976	958719	1041280	52 044304 003023
9955727	996971	958756	1041243	51 044272 003028
10955760	996966	958794	1041205	50 044239 003033
11955793	996961	958831	1041168	49 044206 003038
129558259	996956	958869	1041130	48 044174 003043
13955858	996951	958906	1041093	47 044141 003048
14955890	996946	958944	1041055	46 044109 003053
15955923	996941	958981	1041018	45 044076 003058
16955955	996937	959018	1040981	44 044044 003062
17965988	996932	959056	1040943	43 044011 003067
18956020	996927	959093	1040906	42 043979 003072
19956053	996922	959130	1040869	41 043946 003077
20956085	996917	959168	1040831	40 043914 003082
21956117	996912	959205	1040794	39 043882 003087
22956150	996907	959242	1040757	38 043849 003092
23956182	996902	959279	1040720	37 043817 003097
24956214	996897	959317	1040682	36 043785 003102
25956246	996892	959354	1040645	35 043753 003107
26956279	996887	959391	1040608	34 043720 003112
27956311	996882	959428	1040571	33 043688 003117
28956343	996877	959465	1040534	32 043656 003122
29956375	996872	959502	1040497	31 043624 003127
30956407	996867	959539	1040460	30 043592 003132

	Sine Comple.	Tang. Comple.	Tang. Comple.	Com. ar. of Sine.	Com. ar. of Si.co.
984	30 956407	996867	959539	1040460	30 043592 003132
989	31 956439	996862	959576	1040423	29 043560 003137
994	32 956471	996857	959613	1040386	28 043528 003143
999	33 956503	996852	959650	1040349	27 043496 003147
004	34 956535	996847	959687	1040312	26 043464 003152
009	35 956567	996842	959724	1040275	25 043432 003157
014	36 956599	996837	959761	1040238	24 043400 003162
018	37 956631	996832	959798	1040201	23 043368 003167
023	38 956663	996827	959835	1040164	22 043336 003172
028	39 956695	996822	959872	1040127	21 043304 003177
033	40 956726	996817	959909	1040090	20 043273 003182
038	41 956758	996812	959945	1040054	19 043241 003187
043	42 956790	996807	959982	1040010	18 043209 003192
048	43 956822	996802	950019	1049980	17 043177 003197
053	44 956853	996797	950056	1039943	16 043146 003202
058	45 956885	996792	950092	1039907	15 043114 003207
062	46 956917	996787	950129	1039870	14 043082 003212
067	47 956948	996782	950166	1039833	13 043051 003217
072	48 956980	996777	950202	1039797	12 043019 003222
077	49 957012	996772	950239	1039769	11 042988 003227
082	50 957043	996767	950276	1039733	10 042956 003232
087	51 957075	996762	950312	1039687	9 042924 003237
092	52 957106	996757	950349	1039650	8 042893 003242
097	53 957138	996752	950385	1039614	7 042861 003247
002	54 957169	996747	950422	1039577	6 042830 003252
007	55 957200	996742	950458	1039541	5 042799 003257
112	56 957232	996736	950495	1039504	4 042767 003263
117	57 957263	996731	950531	1039468	3 042736 003268
122	58 957294	996726	950568	1039431	2 042705 003273
127	59 957326	996721	950604	1039395	1 042673 003278
132	60 957357	996716	950640	1039359	0 042642 003283

Sine
Comple. | Sine
Comple. | Tangent
Comple. | Tang. | 68

22 Sine.	Sine comple.	Tang.	Tangent comple.	com. ay.	com. ay. of sine.	22
0957357	996716960640	10393596	042642	00331	30	
1957388	996711960677	103932249	042611	00331	31	
2957420	996706960713	103928658	042579	00329	32	
3957451	996701960749	103925057	042548	00329	33	
4957482	996696960786	103921356	042517	00330	34	
5957513	996691960822	103917755	042486	00330	35	
6957544	996685960858	103914154	042455	00331	36	
7957575	996680960895	10391045	042424	00331	37	
8957606	996675960931	103906854	042393	00332	38	
9957637	996670960967	103903251	042362	00333	39	
10957668	996665961003	103899650	042331	00333	40	
11957699	996660961039	103896049	042300	00333	41	
12957730	996655961075	103892448	042269	00334	42	
13957761	996649961111	103888847	042238	00335	43	
14957792	996644961148	103885146	042207	00335	44	
15957823	996639961184	103881549	042176	00336	45	
16957854	996634961220	103877944	042145	00336	46	
17957885	996629961256	103874343	042114	00337	47	
1895791	996624961292	103870742	042083	00337	48	
19957946	996618961328	103867141	042053	00338	49	
20957977	996613961364	103863540	042022	00338	50	
21958008	996608961400	103860034	041991	00339	51	
22958039	996603961435	103856438	041960	00339	52	
23958069	996598961471	103852837	041930	00340	53	
24958100	996592961507	103849236	041899	00340	54	
25958131	996587961543	103845634	041868	00341	55	
26958161	996582961579	103842034	041838	00341	56	
27958192	996577961615	103838433	041807	00342	57	
28958222	996571961650	103834932	041777	00342	58	
29958253	996566961686	103831331	041746	00343	59	
30958283	996561961722	103827730	041716	00343	60	

Sine
Comple. | Sine. | Tangent
Comple. | Tang. 67

22	Sine	Sine Comple.	Tang.	Tangent Comple.	Com. ar. of Sine.	com. ar. of Si. co.
20	958283	996561	961721	1038277	30041716	003438
31	958314	996556	961758	1038241	29041685	003443
32	958344	996551	961793	1038206	28041655	003448
33	958375	996545	961829	1038170	27041624	003454
34	958405	996540	961865	1038134	26041594	003459
35	958436	996535	961900	1038099	25041563	003464
36	958466	996530	961936	1038063	24041533	003469
37	958496	996524	961972	1038027	23041503	003475
38	958527	996519	962007	1037992	22041472	003480
39	958557	996514	962043	1037956	21041442	003485
40	958587	996508	962078	1037921	20041412	003491
41	958617	996503	962114	1037885	19041382	003496
42	958648	996498	962149	1037850	18041351	003501
43	958678	996493	962185	1037814	17041321	003506
44	958708	996487	962220	1037779	16041291	003512
45	958738	996482	962256	1037743	15041261	003517
46	958768	996477	962291	1037708	14041231	003522
47	958798	996471	962326	1037673	13041201	003528
48	958829	996466	962362	1037637	12041171	003533
49	958858	996461	962397	1037602	11041141	003538
50	958888	996456	962432	1037567	10041111	003543
51	958918	996450	962468	1037531	9041081	003549
52	958948	996445	962503	1037496	8041051	003554
53	958978	996440	962538	1037461	7041021	003559
54	959008	996434	962574	1037425	6040991	003565
55	959038	996429	962609	1037390	5040961	003570
56	959068	996424	962644	1037355	4040931	003575
57	959098	996418	962679	1037320	3040901	003581
58	959128	996413	962714	1037285	2040871	003586
59	959158	996407	962750	1037249	1040841	003591
60	959187	996402	962785	1037214	0040812	003597

Sine
Comple. | Sine. | Tangent
Comple. | Tang. | 67

23	Sine	Sine Compl.	Tang.	Tangent Compl.	Com. ar.	Com. ar. of sine	Com. ar. of Si. ci.
0959187	996402	962785	1037214	60040812	003957	30	
1959217	996397	962820	1037179	59040782	003602	31	
2959247	996391	962855	1037144	58040752	003603	32	
3959276	996386	962890	1037109	57040723	003613	33	
4959306	996381	962925	1037074	56040693	003618	34	
5959336	996375	962960	1037029	55040663	003624	35	
6959365	996370	962995	1037004	54040634	003629	36	
7959395	996364	963030	1036969	53040604	003635	37	
8959425	996359	963065	1036934	52040574	003640	38	
9959454	996354	963100	1036899	51040545	003645	39	
10959484	996348	963135	1036864	50040515	003651	40	
11959513	996343	963170	1036829	49040486	003659	41	
12959543	996337	963205	1036794	48040456	003662	42	
13959572	996332	963240	1036759	47040427	003667	43	
14959603	996327	963275	1036724	46040397	003672	44	
15959631	996321	963309	1036690	45040368	003678	45	
16959660	996316	963344	1036655	44040339	003683	46	
17959690	996310	963379	1036620	43040309	003689	47	
18959719	996305	963414	1036585	42040280	003694	48	
19959748	996299	963449	1036550	41040251	003700	49	
20959778	996294	963483	1036516	40040221	003705	50	
21959807	996289	963518	1036481	39040192	003710	51	
22959836	996283	963553	1036446	38040163	003716	52	
23959866	996278	963587	1036412	37040133	003721	53	
24959895	996272	963622	1036377	36040104	003727	54	
25959924	996267	963657	1036342	35040075	003732	55	
26959953	996261	963691	1036308	34040046	003738	56	
27959982	996256	963726	1036273	33040017	003743	57	
28960011	996250	963761	1036238	32039988	003749	58	
29960040	996245	963795	1036204	31039959	003754	59	
30960069	996239	963830	1036169	30139930	003760	60	

Sine
comple. | Sine
comple. | Tangent
comple. | Tang. 66

23	Sine Comple.	Tang. Comple.	Tangent Comple.	com. ar. of sine	com. ar. of fi. co.
30	960069996239	963830	103616930	039930	003760
31	960099996234	963864	103613529	039900	003765
32	960128996228	963899	103610028	039871	003771
33	960157996223	963933	103606627	039842	003776
34	960186996217	963968	103603126	039814	003782
35	960214996212	964002	103599725	039785	003787
36	960243996206	964037	103596224	039756	003793
37	960272996201	964071	103592823	039727	003798
38	960301996195	964105	103589422	039698	003804
39	960330996190	964140	103585921	039669	003809
40	960359996184	964174	103582520	039640	003815
41	960388996179	964209	103579019	039611	003820
42	960416996173	964243	103575618	039583	003826
43	960445996168	964277	103572217	039554	003832
44	960474996162	964312	103568716	039525	003837
45	960503996156	964346	103565315	039496	003843
46	960531996151	964380	103561914	039468	003848
47	960560996145	964414	103558513	039439	003854
48	960589996140	964449	103555012	039410	003859
49	960617996134	964483	103551611	039382	003865
50	960646996129	964517	103548210	039353	003870
51	960675996123	964551	10354489	039324	003876
52	960703996117	964585	10354148	039296	003882
53	960732996112	964619	10353807	039267	003887
54	960760996106	964654	10353466	039239	003893
55	960789996101	964688	10353115	039210	003898
56	960817996095	964722	10352774	039182	003904
57	960846996089	964756	10352433	039153	003910
58	960874996084	964790	10352092	039125	003915
59	960902996078	964824	10351751	039097	003921
60	960931996073964858	10351410	039068	003926	

Sine
Comple. | Sine. | Tangent
Comple. | Tang. | 66

24	Sine. comple.	Sine. comple.	Tang. comple.	Tangent. comple.	com. ar. of sine.	com. ar. of sine. of fin. co.
0	960931	996073	964858	103514116	039068	003926
1	960959	996067	964892	103510759	039040	003932
2	960988	996061	964926	103507358	039011	003938
3	961016	996056	964960	103503957	038983	003943
4	961044	996050	964994	103500556	038955	003949
5	961072	996044	965028	103497155	038927	003955
6	961101	996039	965061	103493854	038898	003960
7	961129	996033	965095	103490453	038870	003966
8	961157	996027	965129	103487052	038842	003972
9	961185	996022	965163	103483651	038814	003977
10	961213	996016	965197	103480250	038786	003983
11	961242	996010	965231	103476849	038757	003989
12	961270	996005	965265	103473448	038729	003994
13	961298	995999	965298	103470147	038701	004000
14	961326	995993	965332	103466746	038673	004006
15	961354	995988	965366	103463345	038645	004011
16	961382	995982	965400	103459944	038617	004017
17	961410	995976	965433	103456643	038589	004023
18	961438	995971	965467	103453242	038561	004028
19	961466	995965	965501	103449841	038533	004034
20	961494	995959	965534	103446540	038505	004040
21	961522	995953	965568	103443139	038477	004046
22	961550	995948	965602	103439738	038449	004051
23	961578	995942	965635	103436437	038421	004057
24	961605	995936	965669	103433036	038394	004063
25	961633	995931	965702	103429735	038366	004068
26	961661	995925	965736	103426334	038338	004074
27	961689	995919	965769	103423033	038310	004080
28	961717	995913	965803	103419632	038281	004086
29	961744	995908	965836	103416331	038255	004091
30	961772	995902	965870	103412930	038227	004097

Sine
Comple. | Sine.
Comple. | Tangent.
Comple. | Tang. 65

	Sine.	Sine comple.	Tang.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
24	995902	995902	965870	1034129	30038227	004097
926	1961772	995896	965903	1034096	29038199	004103
932	1961800	995896	965937	1034062	2803	171004109
938	2961828	995890	965937	1034029	27038144	004115
943	3961855	995885	965970	1034029	26038116	004120
949	4961883	995879	966004	1033995	25038088	004126
955	5961911	995873	966037	1033962	25038088	004132
960	6961938	99586	966070	1033929	24038061	004138
966	7961966	995861	966104	1033895	23038033	004143
972	8961999	995856	966137	1033862	22038006	004149
977	9962021	995850	966171	1033828	21037978	004155
983	0962048	995844	966204	1033795	20037951	004155
989	1962076	995838	966237	1033762	19037923	004161
994	2962103	995832	966270	1033729	18037896	004167
000	3962131	995827	966304	1033695	17037868	004172
006	4962158	995821	966337	1033662	16037841	004178
011	5962186	995815	966370	1033629	15037813	004184
017	6962213	995809	966403	1033596	14037786	004190
023	7962240	995803	966437	1033562	13037759	004196
028	8962268	995797	966470	1033539	12037731	004202
034	9962295	995792	966503	1033496	11037704	004207
040	0962322	995786	966536	1033463	10037677	004213
046	1962350	995780	966569	1033430	9037649	004219
051	2962377	995774	966602	1033397	8037622	004225
057	3962404	995768	966635	1033364	7037595	004231
063	4962431	995762	966669	1033330	6037568	004237
068	5962459	995756	966702	1033297	5037540	004243
074	6962486	995751	966735	1033264	4037513	004248
080	7962513	995745	966768	1033231	3037486	004254
086	8962540	995739	966801	1033198	2037459	004260
091	9962567	995733	966834	1033165	1037432	004266
097	0962594	995727	966867	1033132	0037405	004272

25 Sine.	Sine comple.	Tang.	Tangent comple.	com. ar. of sine.	com. ar. of sine.	25
0 962594	995721	966867	1033132	60	037405	00427
1 962621	995721	966900	1033099	59	037378	00427
2 962648	995715	966933	1033066	58	037351	00428
3 962676	995709	966966	1033033	57	037323	00429
4 962703	995703	966999	1033000	56	037296	00429
5 962730	995698	967031	1032968	55	037269	00430
6 962757	995692	967064	1032935	54	037242	00430
7 962783	995686	967097	1032902	53	037216	00431
8 962810	995680	967130	1032869	52	037189	00431
9 962837	995674	967163	1032836	51	037162	00432
10 962864	995668	967196	1032803	50	037135	00433
11 962891	995662	967229	1032770	49	037108	00433
12 962918	995656	967261	1032738	48	037081	00434
13 962945	995650	967294	1032705	47	037054	00434
14 962972	995644	967327	1032672	46	037027	00435
15 962998	995638	967360	1032639	45	037001	00436
16 963025	995632	967392	1032607	44	036974	00436
17 963052	995626	967425	1032574	43	036947	00437
18 963070	995620	967458	1032541	42	036920	00437
19 963105	995614	967491	1032508	41	036994	00438
20 963132	995608	967523	1032476	40	036867	00439
21 963159	995602	967556	1032443	39	036840	00439
22 963185	995596	967589	1032410	38	036814	00440
23 963212	995590	967621	1032378	37	036787	00440
24 963239	995584	967654	1032345	36	036760	00441
25 963265	995578	967686	1032313	35	036734	00441
26 963292	995572	967719	1032280	34	036707	00442
27 963318	995566	967752	1032247	33	036681	00443
28 963345	995560	967784	1032215	32	036654	00443
29 963371	995554	967817	1032182	31	036628	00444
30 963398	995548	967849	1032150	30	036601	00445

Sine Comple. Sine. Tang. Tang. 64

	Sine	Sine	Tangent	Tangent	Com. ar.	Com. ar.
	Comple.	Comple.	Comple.	Comple.	of Sine.	of Si. co.
425	963398	995548	967849	103215030	036601	004451
427	963424	995542	967882	1032117	29036575	004457
428	963451	995536	967914	1032085	28036548	004463
429	963477	995530	967947	1032052	27036522	004469
429	963504	995524	967979	1032020	26036495	004475
430	963530	995518	968011	1031988	25036469	004481
430	963556	995512	968044	1031955	24036443	004487
431	963583	995506	968076	1031923	23036416	004493
431	963609	995500	968109	1031890	22036390	004499
432	963636	995494	968141	1031858	21036363	004505
433	963662	995488	968173	1031826	20036337	004511
433	963688	995482	968206	1031793	19036311	004517
434	963714	995476	968238	1031761	18036285	004523
434	963741	995470	968270	1031729	17036258	004529
435	963767	995464	968303	1031696	16036232	004535
436	963793	995457	968335	1031664	15036206	004542
436	963819	995451	968367	1031632	14036180	004548
437	963845	995445	968400	1031599	13036154	004554
437	963871	995439	968432	1031567	12036128	004560
438	963898	995433	968464	1031535	11036101	004566
439	963924	995427	968496	1031503	10036075	004572
439	963950	995421	968529	1031470	9036049	004578
440	964976	995415	968561	1031438	8036023	004584
440	964002	995409	968593	1031406	7035997	004590
441	964028	995402	968625	1031374	6035971	004597
442	964059	995396	968657	1031342	5035945	004603
442	964080	995390	968689	1031310	4035919	004609
443	964106	995384	968721	1031278	3035893	004615
443	964132	995378	968754	1031245	2035867	004621
444	964155	995372	968786	1031213	1035841	004627
445	964184	995366	968818	1031181	0035815	004633

26	Sine.	Sine Compl.	Tang.	Tang. Compl.	Com. ar.	Com. ar. of sine	Com. ar. of sine
0	964184	995366968818	1031181	60035815	00467		
1	964210	995359963850	1031149	59035789	00467		
2	964235	995353968882	1031187	58035764	00467		
3	964261	995347968914	1031085	57035738	00467		
4	964287	995341968946	1031053	56035712	00467		
5	964313	995225968978	1031021	55035686	00466		
6	964339	995328969010	1030989	54035660	00467		
7	964365	995322969042	1030957	53035634	00467		
8	964390	995316969074	1030925	52035609	00468		
9	964416	995310969106	1030893	51035583	00468		
10	964442	995304969138	1030861	50035557	00469		
11	964467	995297969170	1030830	49035532	00470		
12	964493	995291969201	1030798	48035506	00470		
13	964519	995285969233	1030766	47035480	00471		
14	964544	995279969265	1030734	46035455	00472		
15	964570	995273969297	1030702	45035429	00472		
16	964596	995266969329	1030670	44035403	00473		
17	964621	995260969361	1030638	43035378	00473		
18	964647	995254969392	1030607	42035352	00474		
19	964672	995248969424	1030575	41035327	00475		
20	964698	995241969456	1030543	40035301	00475		
21	964723	995235969480	1030511	39035276	00476		
22	964749	995229969520	1030479	38035250	00477		
23	964774	995223969551	1030448	37035225	00477		
24	964800	995216969583	1030416	36035199	00478		
25	964825	995210969615	1030384	35035174	00478		
26	964851	995204969646	1030353	34035148	00479		
27	964876	995297969678	1030321	33035123	00480		
28	964902	995291969710	1030289	32035097	00480		
29	964927	995285969741	1030258	31035072	00481		
30	964952	995279969773	10.0226	30035047	00482		

Sine
comple. | Sine | Tangent
comple. | Tang. 63

26	Sine.	Sine comple.	Tang.	Tangent complem.	com. ar. com. ar. of Sine. of fi. co.
30	964952	995179	969773	1030226	30035047 004820
31	964978	995172	969805	1030194	29035021 004827
32	965003	995166	969836	1030163	28034996 004833
33	965028	995160	969868	1030131	27034971 004839
34	96505	995153	969900	1030099	26034946 004846
35	965079	995147	969931	1030068	25034920 004852
36	965104	995141	969963	1030036	24034895 004858
37	965129	995134	969994	1030005	23034870 004865
38	965154	995128	970026	1029973	22034845 004871
39	965180	995122	970057	1029942	21034819 004877
40	965205	995115	970089	1029910	20034794 004884
41	965230	995109	970120	1029879	19034769 004890
42	965255	995103	970152	1029847	18034744 004896
43	965280	995096	970183	1029816	17034719 004903
44	965305	995090	970215	1029784	16034694 004906
45	965330	995084	970246	1029753	15034669 004915
46	965355	995077	970278	1029721	14034644 004922
47	965380	995071	970309	1029690	13034619 004928
48	965405	995065	970340	1029659	12034594 004935
49	965430	995058	970372	1029627	11034569 004941
50	965455	995052	970403	1029596	10034544 004947
51	965480	995045	970434	1029565	9034519 004954
52	965505	995039	970466	1029533	8034494 004960
53	965530	995033	970497	1029502	7034469 004966
54	965555	995026	970528	1029471	6034444 004973
55	965580	995020	970560	1029439	5034419 004979
56	965605	995013	970591	1029408	4034394 004986
57	965630	995007	970622	1029377	3034369 004993
58	965655	995000	970654	1029345	2034344 004999
59	965679	995994	970685	1029314	1034320 005005
60	965704	995988	970716	1029283	0034295 005011

Sine
comple. | Sine. | Tangent
comple. | Tang. | 63

27	Sine Comple.	Tang. Comple.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Sine.
0	965704	994988	970716	1029283	60034295 005011
1	965729	994981	970747	1029252	59034270 005018
2	965754	994975	970779	1029220	58034245 005024
3	965778	994968	970810	1029189	57034221 005031
4	965803	994962	970841	1029158	56034196 005037
5	965828	994955	970872	1029127	55034171 005044
6	965853	994949	970903	1029096	54034146 005050
7	965877	994942	970934	1029065	53034122 005057
8	965902	994936	970966	1029033	52034097 005063
9	965927	994929	970997	1029002	51034072 005079
10	965951	994923	971028	1028971	50034048 005076
11	965976	994917	971059	1028940	49034023 005083
12	966000	994910	971090	1028909	48033999 005089
13	966025	994904	971121	1028878	47033974 005095
14	966050	994897	971152	1028847	46033949 005101
15	966074	994891	971183	1028816	45033925 005108
16	966099	994884	971214	1028785	44033900 005115
17	966123	994877	971245	1028754	43033876 005122
18	966148	994871	971276	1028723	42033851 005128
19	966172	994864	971307	1028692	41033827 005135
20	966197	994858	971338	1028661	40033802 005141
21	966221	994851	971369	1028630	39033778 005148
22	966245	994845	971400	1028591	38033754 005154
23	966270	994838	971431	1028568	37033729 005161
24	966294	994832	971462	1028537	36033705 005167
25	966319	994825	971493	1028506	35033681 005174
26	966343	994819	971524	1028475	34033656 005180
27	966367	994812	971555	1028444	33033632 005187
28	966391	994806	971585	1028414	32033608 005193
29	966416	994799	971616	1028383	31033583 005200
30	966440	994792	971647	1028352	30033559 005207

	Sine	Sine Comple.	Tang.	Tang. Comple.	Com. ar. of Sine.	Com. ar. of Si. co.
27	966449	994792	971647	1028352	30	033559 005207
31	966464	994786	971678	1028321	29	033535 005213
32	966489	994779	971709	1028290	28	033510 005220
33	966513	994773	971740	1028259	27	033486 005226
34	966537	994766	971770	1028229	26	033462 005233
35	966561	994759	971801	1028198	25	033438 005240
36	966585	994753	971832	1028167	24	033414 005246
37	966610	994726	971863	1028136	23	033389 005253
38	966634	994740	971894	1028105	22	033365 005259
39	966658	994733	971924	1028075	21	033341 005266
40	966682	994726	971955	1028044	20	033317 005273
41	966706	994720	971986	1028013	19	033293 005279
42	966730	994713	972016	1027983	18	033269 005286
43	966754	994707	972047	1027952	17	033245 005293
44	966778	994700	972078	1027921	16	033221 005299
45	966802	994693	972108	1027891	15	033197 005306
46	966826	994687	972139	1027860	14	033173 005312
47	966850	994680	972170	1027829	13	033149 005319
48	966874	994673	972200	1027799	12	033125 005326
49	966898	994667	972231	1027768	11	033101 005332
50	966922	994660	972262	1027737	10	033077 005339
51	966946	994653	972293	1027707	9	033053 005346
52	966970	994647	972323	1027676	8	033029 005352
53	966794	994640	972353	1027646	7	033005 005359
54	967018	994633	972384	1027615	6	032981 005366
55	967041	994627	972414	1027585	5	032958 005372
56	967065	994620	972445	1027554	4	032934 005379
57	967089	994613	972475	1027524	3	032910 005386
58	967113	994606	972506	1027493	2	032886 005393
59	967137	994600	972536	1027463	1	032862 005399
60	967160	994593	972567	1027432	0	032839 005406
	Sine Comple.	Sine	Tangent Comple.	Tang.	62	

28 Sinc.	Sine Comple.	Tang. Comple.	Tangent Comple.	com. ar. of sine	com. ar. of fine	com. ar. of fi. co.
1967160	994593	972567	1027432	60	032839	005406
1967184	994586	972597	1027402	59	032815	005413
2967208	994580	972628	1027371	58	032791	005419
3967232	994573	972658	1027341	57	032767	005426
4967255	994566	972689	1027310	56	032744	005433
5967279	994559	972719	1027280	55	032720	005440
6967303	994553	972750	1027249	54	032696	005446
7967326	994546	972780	1027219	53	032673	005453
8967350	994539	972810	1027189	52	032649	005460
9967374	994532	972841	1027159	51	032635	005467
10967397	994526	972871	1027128	50	032602	005473
11967421	994519	972901	1027098	49	032578	005480
12967444	994512	972932	1027067	48	032555	005487
13967468	994505	972952	1027037	47	032531	005494
14967491	994498	972992	1027007	46	032508	005501
15967515	994492	973022	1026974	45	032484	005507
16967538	994485	973053	1026946	44	032461	005514
17967562	99447	973083	1026916	43	032437	005521
18967585	994471	973114	1026889	42	032414	005528
19967609	994465	973144	1026855	41	032390	005534
20967632	994458	973174	1026824	40	032367	005541
21967656	994451	973204	1026795	39	032343	005548
22967679	994444	973235	1026764	38	032320	005555
23967703	994437	973265	1026734	37	032296	005562
24967726	994430	973295	1026704	36	032273	005569
25967749	994424	973225	1026674	35	032250	005575
26967773	994417	973255	1026644	34	032226	005582
27967796	994410	973386	1026613	33	032203	005589
28967819	994403	973416	1026582	32	032180	005596
29967842	994399	973446	1026553	31	032156	005503
30967866	994389	973476	1026523	30	032133	005510

Sine
Comple. | Sine. | Tangent
Comple. | Tang. | 61

	Sine	Sine Comple.	Tang.	Tangent Comple.	Com. ar.	Com. ar.
					of Sine.	of Sine.
06	967866	994389	973476	1026523	30	03213
13	967889	994382	973506	1026493	29	032110
19	967912	994376	973536	1026463	28	032087
26	967936	994369	973566	1026433	27	032063
33	967959	994362	973596	1026403	26	032040
40	967982	994355	973626	1026373	25	032017
46	968005	994348	973656	1026343	24	031994
53	968028	994341	973687	1026313	23	031971
60	968051	994334	973717	1026282	22	031948
67	968075	994327	973747	1026252	21	031924
73	968098	994321	973777	1026222	20	031901
80	968121	994314	973807	1026192	19	031878
87	968144	994307	973837	1026162	18	031855
94	968167	994300	973867	1026132	17	031832
101	968190	994293	974897	1026102	16	031809
107	968213	994286	974927	1026072	15	031786
114	968236	994279	974957	1026042	14	031763
121	968259	994272	974986	1026013	13	031740
128	968282	994265	974016	1025983	12	031717
134	968305	994258	974046	1025953	11	031694
141	968328	994251	974076	1025923	10	031671
148	968351	994244	974106	1025893	9	031648
155	968374	994237	974136	1025863	8	031625
162	968397	994230	974166	1025833	7	031602
169	968420	994223	974196	1025803	6	031579
176	968442	994216	974226	1025773	5	031557
183	968465	994209	974255	1025744	4	031534
190	968488	994202	974285	1025714	3	031511
197	968511	994295	974315	1025684	2	031488
204	968534	994288	974345	1025654	1	031465
211	968557	994281	974375	1025624	0	031442

Sine
Comple. | Sine. | Tangent
Complem. | Tang. | 61

29	Sine comple.	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of si. 11.
0	968557	994181	974375	1025624	60 031443	005818
1	968579	994174	974404	1025595	59 031420	005823
2	968602	994167	974434	1025565	58 031397	005831
3	968625	994160	974464	1025535	57 031374	005839
4	968648	994153	974494	1025505	56 031351	005846
5	968670	994146	974524	1025475	55 031329	005853
6	968693	994139	974553	1025446	54 031306	005860
7	968716	994132	974583	1025416	53 031283	005867
8	968738	994125	974613	1025386	52 031261	005874
9	968761	994118	974642	1025357	51 031238	005881
10	968784	994111	974672	1025327	50 031215	005888
11	968806	994104	974702	1025297	49 031193	005895
12	968829	994097	974731	1025268	48 031170	005902
13	968852	994090	974761	1025238	47 031147	005909
14	968874	994083	974791	1025208	46 031125	005916
15	968897	994076	974820	1025179	45 031102	005923
16	968919	994069	974850	1025149	44 031080	005930
17	968942	994062	974880	1025119	43 031057	005937
18	968964	994055	974909	1025090	42 031035	005944
19	968987	994048	974939	1025060	41 031012	005951
20	969009	994040	974968	1025031	40 030990	005959
21	969032	994033	974998	1025001	39 030967	005966
22	969054	994026	975028	1024971	38 030945	005973
23	969077	994019	975057	1024942	37 030922	005980
24	969099	994012	975087	1024912	36 030900	005987
25	969122	994005	975116	1024883	35 030877	005994
26	969144	994998	975146	1024853	34 030855	006001
27	969166	994991	975175	1024824	33 030833	006008
28	969189	994983	975205	1024794	32 030810	006016
29	969211	994976	975234	1024765	31 030788	006023
30	969233	994969	975264	1024735	30 030766	006030

Sine
comple. | Sine. | Tangent
comple. | Tang. | 60

29	Sine comple.	Tang. comple.	Tangent complem.	com. ar. com. ar. of Sine. of si. co.
30	969233993969975264	1024735	30030766006030	
31	969256993962975293	1024706	29030743006037	
32	969278993955975323	1024676	28030721006044	
33	969300993948975352	1024647	27030699006051	
34	969323993941975382	1024617	26030676006058	
35	969345993933975411	1024588	25030654006066	
36	969367993926975440	1024559	24030632006073	
37	969389993919975470	1024529	23030610006080	
38	969412993912975499	1024500	22030587006087	
39	969434993905975529	1024470	21030565006094	
40	969456993897975558	1024441	20030543006102	
41	969478993890975587	1024412	19030521006109	
42	969500993883975617	1024382	18030499006116	
43	969522993876975646	1024353	17030477006123	
44	969545993869975675	1024324	16030454006130	
45	969567993861975705	1024294	15030432006138	
46	969589993854975734	1024265	14030410006145	
47	969611993847975763	1024236	13030388006152	
48	969633993840975793	1024206	12030366006159	
49	969655993833975822	1024177	11030344006167	
50	969677993825975851	1024148	10030322006174	
51	969699993818975880	1024119	9030300006181	
52	969721993811975910	1024089	8030278006188	
53	969743993804975939	1024060	7030256006196	
54	969765993796975968	1024031	6030234006203	
55	969787993789975997	1024002	5020212006210	
56	969809993782976027	1023972	4030190006217	
57	969831993774976056	1023943	3030168006225	
58	969853993767976085	1023914	2030146006232	
59	969875993760976114	1023885	1030124006239	
60	969897993753976143	1023856	0030103006246	

Sine
comple. | Sine. | Tangent
comple. | Tang. | 60

30 Sine.	Sine Comple.	Tang.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Sine. of Si. co.
9969897	993752	976142	1023856	60'030103	006246
1969918	993745	976173	1023826	59 030081	006251
2969940	993738	976202	1023797	58 030059	006261
3969962	993731	976231	1023768	57 030037	006268
4969984	993723	976260	1023739	56 030015	006276
5970006	993716	976289	1023710	55 029993	006283
6970028	993709	976318	1023651	54 029971	006290
7970049	993701	976347	1023652	53 029950	006298
8970071	993694	976377	1023623	52 029928	006305
9970093	993687	976406	1023593	51 029906	006312
10970115	993679	976435	1023564	50 029884	006320
11970136	993672	976464	1023535	49 029863	006327
12970158	993665	976493	1023506	48 029841	006334
13970180	993657	976522	1023477	47 029819	006342
14970201	993650	976551	1023448	46 029798	006349
15970223	993643	976580	1023419	45 029776	006356
16970245	993635	976609	1023390	44 029754	006364
17970266	993628	976638	1023361	43 029733	006371
18970288	993620	976667	1023332	42 029711	006379
19970310	993613	976696	1023303	41 029689	006386
20970221	993606	976725	1023274	40 029668	006393
21970353	993598	976754	1023245	39 029646	006401
22970374	993591	976783	1023216	38 029625	006408
23970396	993584	976812	1023187	37 029603	006415
24970417	993576	976841	1023158	36 029582	006423
25970439	993569	976870	10231293	35 029560	006430
26970460	993561	976899	10231003	34 029539	006438
27970482	993554	976928	10230713	33 029517	006445
28970503	993546	976957	10230423	32 029496	006453
29970525	993539	976985	10230143	31 029474	006460
30970546	993532	977014	1023985	30 029453	006467

Sine
compl. | Sine. | Tangent
compl. | Complem. | Tang. 59

	Sine	Sine Comple.	Tang.	Tangent Comple.	Com. ar. of Sine.	com. ar. of Si. co.
246	970546	993532	977014	1022985	30029453	006467
254	970568	993524	977043	1022956	29029431	006475
261	970589	993517	977072	1022927	28029410	006432
268	970611	993509	977101	1022898	27029388	006493
276	970632	993502	977130	1022869	26029367	006497
283	970653	993494	977159	1022840	25029346	006505
290	970675	993487	977188	1022811	24029324	006512
298	970696	993479	977216	1022783	23029303	006520
305	970718	993472	977245	1022754	22029281	006527
312	970739	993464	977274	1022725	21029260	006535
320	970760	993457	977303	1022695	20029239	006542
327	970781	993449	977332	1022667	19029218	006550
334	970803	993442	977360	1022639	18029196	006557
342	970824	993434	977389	1022610	17029175	006565
349	970845	993427	977418	1022581	16029154	006572
356	970866	993419	977447	1022552	15029133	006580
364	970888	993412	977475	1022524	14029111	006587
371	970909	993404	977504	1022495	13029090	006595
379	970930	993397	977533	1022466	12029069	006602
386	970951	993389	977562	1022437	11029048	006610
393	970972	993382	977590	1022409	10029027	006617
401	970994	993374	977619	1022380	9029005	006625
408	971015	993367	977648	1022351	8028984	006632
415	971036	993359	977676	1022323	7028963	006640
423	971057	993352	977705	1022294	6028942	006647
430	971078	993344	977734	1022265	5028921	006655
438	971099	993336	977762	1022237	4028900	006663
445	971120	993329	977791	1022208	3028879	006670
453	971141	993321	977820	1022179	2028858	006678
460	971162	993314	977848	1022151	1028837	006685
467	971183	993306	977877	1022122	0028816	006693

Sine
Comple. | Sine. | Tangent
Comple. | Tang. | 59

Sine Comple.	Sine Comple.	Tang. Comple.	Tangens Comple.	com. ar. com. ar. of sine of sine
997118 2993306	977877	10212260	02818 16	006693
1971204 993298	977905	102 094 59	028795	006701
2971225 993291	977934	1022065 58	028774	006708
3971246 993283	977963	1022036 57	028753	006716
4971267 993276	977991	1022008 56	028732	006723
5971288 993268	978020	1021979 55	028711	006731
6971309 993260	978048	1021951 54	028690	006739
7971330 993253	978077	1021922 53	028669	006746
8971351 993245	978106	1021893 52	028648	006754
9971372 993238	978134	1021865 51	028627	006761
1097139 993230	978163	1021836 50	028606	006769
1197141 993222	978191	1021808 49	02858	006777
12971435 993215	978220	1021779 48	028564	006784
13971456 99320	978248	1021751 47	028543	006791
14971476 993199	978277	1021722 46	02852	006800
15971497 993192	978305	1021694 45	028502	006807
16971518 993184	978334	1021665 44	028481	006815
17971539 993176	978362	1021637 43	028460	006823
18971560 993169	978391	1021608 42	028439	006830
199715 0 993161	978419	1021580 41	028419	006838
2097160 1 993155	97844	1021557 40	028398	006846
21971622 993146	978476	1021523 39	028377	006853
22971643 993138	97850	1021495 38	028356	006861
23971663 993130	978533	1021466 37	028336	006869
2497168 1 993122	978561	1021438 36	028315	006877
2597170 1 993111	978590	1021409 35	028294	006884
26971725 993107	978618	1021381 34	028274	006892
27971746 993099	97864	1021353 33	028253	006900
28971767 993092	97861	1021324 32	028232	006907
29971787 993084	978703	1021296 31	028212	006915
3097180 993076	97731	1021268 30	028191	006922

Sine
Comple. | Sine. Tangens
Comple. | Tang. 58

	Sine comple.	Tang. comple.	Tangent complem.	com. ar. of Sine.	com. ar. of fi. co.
30	971808	993076	978733	1021268	30 028191 006923
31	971829	993068	978760	1021239	29 028170 006931
32	971849	993061	978788	1021211	28 028150 006938
33	971870	993053	978816	1021183	27 028139 006946
34	971890	993045	978845	1021154	26 028119 006954
35	971911	993037	978873	1021126	25 028088 006962
36	971931	993030	978901	1021098	24 028065 006969
37	971952	993022	978930	1021069	23 028047 006977
38	971973	993014	978958	1021041	22 028027 006985
39	971993	993006	978986	1021013	21 028006 006993
40	972013	992998	979015	1020984	20 027986 007001
41	972034	992991	979043	1020956	19 027965 007008
42	972054	992983	979071	1020928	18 027945 007016
43	972075	992975	979099	1020900	17 027924 007024
44	972095	992967	979128	1020871	16 027904 007032
45	972116	992959	979156	1020843	15 027883 007040
46	972136	992952	979184	1020815	14 027863 007047
47	972157	992944	979212	1020787	13 027842 007055
48	972177	992936	979241	1020758	12 027822 007063
49	972197	992928	979269	1020730	11 027802 007071
50	972218	992920	979297	1020702	10 027781 007079
51	972238	992912	979325	1020674	9 027761 007087
52	972258	992905	979353	1020646	8 027741 007094
53	972279	992897	979381	1020618	7 027720 007102
54	972299	992889	979410	1020589	6 027700 007110
55	972319	992881	979438	1020561	5 027680 007118
56	972340	992873	979466	1020533	4 027660 007126
57	972360	992865	979494	1020505	3 027639 007124
58	972380	992857	979522	1020477	2 027619 007142
59	972400	992849	979550	1020449	1 027599 007150
60	972420	992842	979578	1020421	0 027579 007157

Sine
comple. | Sine. | Tangent
comple. | Tang. | 58

32	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of sine.	com. ar. of tan.
0	972420	992842	979578	1020421	60027579007157
1	972441	992834	979607	1020392	59027558007165
2	972461	992826	979635	1020364	58027538007173
3	972481	992818	979663	1020336	57027518007181
4	972501	992810	979691	1020308	56027498007189
5	972521	992802	979719	1020280	55027478007197
6	972542	992794	979747	1020252	54027457007205
7	972562	992786	979775	1020224	53027437007213
8	972582	992778	979803	1020196	52027417007221
9	972602	992770	979831	1020168	51027397007229
10	972622	992762	979859	1020140	50027377007237
11	972642	992754	979887	1020112	49027357007245
12	972662	992746	979915	1020084	48027337007253
13	972682	992738	979943	1020056	47027317007261
14	972702	992731	979971	1020028	46027297007268
15	972722	992723	979999	1020000	45027277007276
16	972742	992715	980027	1019972	44027257007284
17	972762	992707	980055	1019944	43027237007292
18	972782	992699	980083	1019916	42027217007300
19	972802	992691	980111	1019888	41027197007308
20	972822	992683	980139	1019860	40027177007316
21	972842	992675	980167	1019832	39027157007324
22	972862	992667	980195	1019804	38027137007332
23	972882	992659	980223	1019776	37027117007340
24	972902	992651	980251	1019748	36027097007348
25	972922	992643	980279	1019720	35027077007356
26	972942	992635	980307	1019692	34027057007364
27	972962	992627	980335	1019664	33027037007372
28	972981	992619	980362	1019637	32027018007380
29	972001	992610	980390	1019609	31027998007389
30	972021	992602	980418	1019581	30027978007397

32	Sine comple.	Sine comple.	Tang.	Tangent comple.	com. ar. of Sine.	com. ar. of Sine. co.
30	973021	992602	980418	1019581	30026978	007397
31	973041	992594	980446	1019553	29026958	007405
32	973061	992586	980474	1019525	28026938	007413
33	973081	992578	980502	1019497	27026918	007421
34	973100	992570	980530	1019469	26026899	007429
35	973120	992562	980558	1019441	25026879	007437
36	973140	992554	980585	1019414	24026859	007445
37	973160	992546	980613	1019386	23026839	007453
38	973179	992538	980641	1019358	22026820	007461
39	973199	992530	980669	1019330	21026800	007469
40	973219	992522	980697	1019302	20026780	007477
41	973239	992514	980724	1019275	19026760	007485
42	973258	992505	980752	1019147	18026741	007494
43	973278	992497	980780	1019219	17026721	007502
44	973298	992489	980808	1019191	16026701	007510
45	973317	992481	980836	1019163	15026681	007518
46	973337	992473	980863	1019136	14026662	007526
47	973356	992465	980891	1019108	13026643	007534
48	973376	992457	980919	1019080	12026623	007542
49	973396	992449	980947	1019052	11026603	007550
50	973415	992440	980974	1019025	10026584	007559
51	973435	992432	981002	1018997	9026564	007567
52	973454	992424	981030	1018969	8026545	007575
53	973474	992416	981057	1018942	7026525	007583
54	973493	992408	981085	1018914	6026506	007591
55	973513	992400	981112	1018886	5026486	007599
56	973532	992391	981141	1018858	4026467	007608
57	973552	992383	981168	1018831	3026447	007616
58	973571	992375	981196	1018803	2026428	007624
59	973591	992367	981224	1018775	1026408	007632
60	973610	992359	981251	1018748	0026389	007640
	Sine comple.	Sine. comple.	Tangent comple.	Tang.	57	

33	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of sine.	com. ar. of sin. co.
0 973610	992359	981251	1018748	60	026389 007640
1 973630	992350	981279	1018720	59	026369 007649
2 973649	992342	981307	1018691	58	026350 007657
3 973669	992334	981334	1018665	57	026330 007665
4 973688	992326	981362	1018637	56	026311 007673
5 973707	992318	981389	1018610	55	026292 007681
6 973727	992309	981417	1018582	54	026272 007690
7 973746	992301	981445	1018554	53	026253 007698
8 973766	992293	981473	1018527	52	026233 007706
9 973785	992285	981500	1018499	51	026214 007714
10 973804	992276	981527	1018472	50	026195 007723
11 973824	992268	981555	1018444	49	026175 007731
12 973843	992260	981583	1018416	48	026156 007739
13 973862	992252	981610	1018389	47	026137 007747
14 973882	992243	981638	1018361	46	026117 007756
15 973901	992235	981665	1018334	45	026098 007764
16 973920	992227	981693	1018306	44	026079 007772
17 973939	992218	981720	1018279	43	026060 007781
18 973959	992210	981748	1018251	42	026040 007789
19 973978	992202	981775	1018224	41	026021 007797
20 973997	992194	981803	1018196	40	026002 007805
21 974016	992185	981830	1018169	39	025983 007814
22 974035	992177	981858	1018141	38	025964 007822
23 974055	992169	981885	1018114	37	025944 007830
24 974074	992160	981913	1018086	36	025925 007839
25 974093	992152	981940	1018059	35	025906 007847
26 974112	992144	981968	1018031	34	025887 007855
27 974131	992135	981995	1018004	33	025868 007864
28 974150	992127	982023	1017976	32	025849 007872
29 974169	992119	982050	1017949	31	025830 007880
30 974188	992110	982078	1017921	30	025811 007889

33	Sine	Comple.	Tang.	Tangent	Com. ar.	Com. ar.
				Complem.	of Sine.	of Si. co.
30	974188	992110	982278	1017921	3	025811
31	974208	992102	982105	1017894	29	025791
32	974227	992093	982133	1017866	28	025732
33	974246	992085	982160	1017839	27	025753
34	974265	992077	982188	1017811	26	025734
35	974284	992068	982215	1017784	25	025715
36	974303	992060	982242	1017757	24	025696
37	974322	992052	982270	1017729	23	025677
38	974341	992043	982297	1017702	22	025658
39	974360	992035	982325	1017674	21	025639
40	974379	992026	982352	1017647	20	025620
41	974398	9920	8982379	1017620	19	025601
42	974417	992009	982407	1017592	18	025582
43	974436	992001	982434	1017565	17	02556
44	974454	991993	982461	1017538	16	025545
45	97 473	991984	982489	1017510	15	025526
46	974492	991970	982516	1017483	14	025507
47	974511	991967	982543	1017456	13	025488
48	974530	991959	98257	1017428	12	025469
49	974549	991950	982598	1017401	11	025450
50	974568	991942	982625	1017374	10	025431
51	974587	991933	982653	1017346	9	025412
52	974605	991925	982680	1017319	8	025394
53	974624	991916	982707	1017292	7	025375
54	974643	991908	982735	1017264	6	025356
55	974662	991899	982762	1017237	5	025337
56	974681	991891	982789	1017210	4	025318
57	974699	991882	982816	1017183	3	025300
58	974718	991874	982844	1017155	2	025281
59	974737	991865	982871	1017128	1	025262
60	974756	991857	982898	1017101	0	025243

34	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
1	974756	991857	982898	1017101	60025243 00813
2	974774	991848	982925	1017074	59025225 008151
3	974793	991840	982953	1017046	58025206 008159
4	974812	991831	982980	1017019	57025187 008168
5	974830	991823	983007	1016992	56025169 008176
6	974849	991814	983034	1016965	55025150 008185
7	974868	991806	983062	1016937	54025131 008193
8	974886	991797	983089	1016910	53025113 008201
9	974905	991789	983116	1016883	52025094 008210
10	974924	991780	983143	1016856	51025075 008219
11	974942	991771	983170	1016829	50025057 008228
12	974961	991763	983198	1016801	49025038 008236
13	974980	991754	983225	1016774	48025019 008245
14	974998	991746	983252	1016747	47025001 008253
15	975017	991737	983279	1016720	46024982 008262
16	975035	991729	983306	1016693	45024964 008271
17	975054	991720	983333	1016666	44024945 008279
18	975072	991711	983361	1016638	43024927 008288
19	975091	991703	983388	1016611	42024908 008296
20	975109	991694	983415	1016584	41024890 008305
21	975128	991685	983442	1016551	40024871 008314
22	975146	991677	983469	1016530	39024853 008322
23	975165	991668	983496	1016503	38024834 008331
24	975183	991660	983523	1016476	37024816 008339
25	975202	991651	983550	1016449	36024797 008348
26	975220	991642	983578	1016421	35024779 008357
27	975239	991634	983605	1016394	34024760 008365
28	975257	991625	983632	1016367	33024742 008374
29	975276	991616	983659	1016340	32024723 008383
30	975294	991608	983686	1016313	31024705 008391
	975312	991599	983713	1016286	30024687 008400

Sine
comple. | Sine. | Tangent
comple. | Tang. | 55

34	Sine Comple.	Tang. Comple.	Tangent Comple.	com. cr. com. ar. of sine of si. co.
30	975312	991599983	713	1016286 3002468 7008400
31	975331	991590	983740	1016259 29024668 008409
32	975349	991582	983767	1016232 28024650 008418
33	975367	991573	983794	1016205 27024632 008426
34	975386	991564	983821	1016178 26024613 008435
35	975404	991555	983848	1016151 25024595 008444
36	975422	991547	983875	1016124 24024577 008452
37	975441	991538	983902	1016097 23024558 008461
38	975459	991529	983929	1016070 22024540 008460
39	975477	991521	983956	1016043 21024522 008478
40	975496	991512	983983	1016016 20024503 008487
41	975514	991503	984010	1015989 19024485 008496
42	975532	991494	984037	1015962 18024467 008505
43	975550	991486	984064	1015935 17024449 008513
44	975565	991477	984091	1015908 16024430 008522
45	975587	991468	984118	1015881 15024412 008531
46	975605	991459	984145	1015854 14024394 008540
47	975623	991450	984172	1015827 13024376 008549
48	975641	991442	984199	1015800 12024358 008557
49	975659	991433	984226	1015773 11024340 008566
50	975678	991424	984253	1015746 10024321 008575
51	975696	991415	984280	1015719 9024303 008584
52	975714	991407	984307	1015692 8024285 008593
53	975732	991398	984334	1015665 7024267 008601
54	975750	991389	984361	1015638 6024249 008610
55	975768	991380	984388	1015611 5024231 008619
56	975786	991371	984415	1015584 4024213 008628
57	975804	991361	984441	1015558 3024195 008637
58	975823	991354	984468	1015531 2024176 008645
59	975841	991345	984495	1015504 1024158 008654
60	975859	991336	984522	1015577 0024140 008663

Sine
Comple. | Sine. | Tangent
Complem. | Tang. CO

35	Sine.	Sine Comple.	Tang.	Tangent Complem.	Com. ar.	Com. ar. of Sine.
9975859	991336	984522	1015477	60	024140	004663
1975877	991327	984549	1015450	59	024122	008671
2975895	991318	984576	1015423	58	024104	008681
3975913	991309	984603	1015396	57	024086	008690
4975931	991301	984630	1015369	56	024068	008698
5975949	991292	984657	1015242	55	024050	008707
6975967	991283	984683	1015316	54	024032	008716
7975985	991274	984710	1015289	53	024014	008725
8976003	991265	984737	1015262	52	023996	008734
9976021	991256	984764	1015235	51	023978	008743
10976038	991247	984791	1015208	50	023966	008752
11976056	991238	984818	1015181	49	023943	008761
12976074	991229	984844	1015155	48	023925	008770
13976092	991220	984871	1015128	47	023907	008779
14976110	991212	98498	1015101	46	023889	008787
15976128	991203	984925	1015074	45	023871	008796
16976146	991194	984952	1015047	44	023853	008805
17976164	991185	984978	1015021	43	023835	008814
18976182	991176	985005	1014994	42	023817	008823
19976199	991167	985032	1014967	41	023800	008832
20976217	991158	985059	1014940	40	023782	008841
21976235	991149	985086	1014913	39	023764	008850
22976253	991140	985112	101487	38	023746	008859
23976271	991131	985139	1014860	37	023728	008868
24976288	991122	985166	1014833	36	023711	008877
25976306	991113	985193	1014806	35	023693	008886
26976324	991104	985219	1014780	34	023675	008895
27976342	991095	985246	1014753	33	023657	008704
28976359	991086	985273	1014726	32	023640	008713
29976377	991077	985300	1014699	31	023622	008722
30976395	991068	985326	1014673	30	023604	008731

	Sine Comple.	Tang. Comple.	Tangene Comple.	Com. ar. of Sine.	Com. ar. of Sine.	Com. ar. of Sine.
35	976395	991068	985326	1014673	30	023604
36	976413	991059	985353	1014646	29	023586
37	976430	991050	985380	1014619	28	023569
38	976448	991041	985406	1014593	27	023551
39	976466	991032	985433	1014566	26	023533
40	976482	991023	985460	1014539	25	023516
41	976501	991014	985487	1014512	24	023498
42	976519	991005	985513	1014486	23	023480
43	976536	990996	985540	1014459	22	023463
44	976554	990987	985567	1014432	21	023445
45	976570	990978	985592	1014406	20	023428
46	976589	990969	985620	1014379	19	023410
47	976607	990960	985647	1014352	18	023392
48	976624	990950	985673	1014326	17	023375
49	976642	990941	985700	1014299	16	023357
50	976659	990933	985727	1014272	15	023340
51	976677	990923	985753	1014246	14	023322
52	976694	990914	985780	1014219	13	023305
53	976712	990905	985806	1014193	12	023287
54	976729	990896	985833	1014166	11	023270
55	976747	990833	985860	1014139	10	023252
56	976764	990878	985886	1014113	9	023235
57	976782	990869	985913	1014086	8	023217
58	976799	990859	985940	1014059	7	023200
59	976817	990850	985966	1014033	6	023182
60	976834	990841	985993	1014006	5	023165
61	976852	990832	986019	1013980	4	023147
62	976869	990823	986046	1013953	3	023130
63	976887	990814	986072	1013927	2	023112
64	976904	990804	986099	1013900	1	023095
65	976921	990795	986126	1013873	0	023078

Sine
Comple. Sine. Tang.
Comple. Tang. 54

Sine	Sine	Tangent	Compl.	Compl.	Com. ar.	Com. ar.
compl.	compl.	compl.	compl.	compl.	of sine	of sine
0976921	990795	986126	1013873	60023078	009306	30
1976939	990786	986152	1013847	59023060	009311	31
2976956	990777	986179	1013820	58023043	009316	32
3976973	990768	986205	1013794	57023026	009321	33
4976991	990759	986232	1013767	56023008	009326	34
5977008	990749	986258	1013741	55022991	009331	35
6977026	990740	986285	1013714	54022973	009336	36
7977043	990731	986311	1013688	53022956	009341	37
8977060	990722	986338	1013661	52022939	009346	38
9977077	990712	986365	1013635	51022922	009351	39
10977095	990703	986391	1013608	50022904	009356	40
11977112	990694	986418	1013581	49022887	009361	41
12977129	990685	986444	1013555	48022870	009366	42
13977147	990675	986471	1013528	47022852	009371	43
14977164	990666	986497	1013502	46022835	009376	44
15977181	990657	986524	1013475	45022818	009381	45
16977198	990648	986550	1013449	44022801	009386	46
17977215	990638	986577	1013422	43022784	009391	47
18977233	990629	986603	1013396	42022766	009396	48
19977250	990620	986629	1013370	41022749	009379	49
20977267	990611	986656	1013343	40022732	009388	50
21977284	990601	986682	1013317	39022715	009398	51
22977301	990592	986709	1013290	38022698	009407	52
23977319	990583	986735	1013264	37022681	009416	53
24977336	990573	986762	1013237	36022663	009426	54
25977353	990564	986788	1013211	35022646	009435	55
26977370	990555	986815	1013184	34022629	009444	56
27977387	990545	986841	1013158	33022612	009454	57
28977404	990536	986868	1013131	32022595	009463	58
29977421	990527	986894	1013105	31022578	009472	59
30977438	990517	986920	1013079	30022561	009481	60

Sine comple. Sine Tang. 53

36	Sine	Comple.	Tang.	Tangent	Comple.	Com. ar.	Com. ar.
						of Sine.	of Si. co.
30	9777438	990517	986920	1013079	20	022561	009484
31	9777455	990508	986947	1013052	29	022544	009491
32	9777472	990499	986973	1013026	28	022527	009500
33	9777489	990489	987000	1012999	27	022510	009510
34	9777506	990480	987026	1012973	26	022493	009519
35	9777523	990471	987056	1012947	25	022470	009528
36	9777541	990461	987079	1012920	24	022458	009538
37	9777558	990452	987105	1012894	23	022441	009547
38	9777575	990442	987132	1012867	22	022424	009557
39	9777591	990433	987158	1012841	21	022408	009566
40	977608	990424	987184	1012815	20	022391	009575
41	977625	990414	987211	1012788	19	022374	009585
42	977642	990405	987237	1012762	18	022357	009594
43	977659	990395	987263	1012736	17	022340	009604
44	977676	990386	987290	1012709	16	022323	009613
45	977693	990377	987316	1012683	15	022306	009622
46	977710	990367	987343	1012656	14	022289	009632
47	977727	990358	987369	1012630	13	022272	009641
48	977744	990348	987395	1012604	12	022255	009651
49	977761	990339	987422	1012577	11	022238	009660
50	977778	990329	987448	1012551	10	022221	009670
51	977795	990320	987474	1012525	9	022204	009679
52	977811	990310	987501	1012498	8	022188	009689
53	977828	990301	987527	1012472	7	022171	009698
54	977845	990291	987553	1012446	6	022154	009708
55	977862	990282	987579	1012420	5	022137	009717
56	977879	990272	987606	1012393	4	022120	009727
57	977895	990263	987632	1012367	3	022104	009736
58	977912	990253	987658	1012341	2	022087	009746
59	977929	990244	987685	1012314	1	022070	009755
60	977946	990234	987711	1012288	0	022053	009765

Sine Comple. Sine. Tang. Complem. Tang. 53

37	Sine Compl.	Tang. Compl.	Tangent Compl.	Com. ar. of sine	Com. ar. of Si. co
0977946	990234	987711	1012288	60022053	009765
1977963	990225	987737	1012262	59022036	009774
2977979	990215	987764	1012236	58022020	009784
3977996	990206	987790	1012209	57022003	009793
4978013	990196	987816	1012183	56021986	009803
5978030	990187	987842	1012157	55021970	009812
6978046	990177	987869	1012130	54021953	009821
7978063	990168	987895	1012104	53021936	009831
8978080	990158	987921	1012078	52021919	009841
9978096	990148	987947	1012052	51021903	009851
10978113	990139	987974	1012025	50021886	009860
11978130	990129	988000	1011999	49021869	009870
12978146	990120	988026	1011973	48021853	009879
13978163	990110	988052	1011947	47021836	009889
14978180	990101	988079	1011921	46021819	009898
15978196	990091	988105	1011894	45021808	009903
16978213	990081	988131	1011868	44021786	009918
17978229	990072	988157	1011842	43021770	009927
18978246	990062	988183	1011816	42021753	009937
19978263	990052	988210	1011789	41021736	009947
20978279	990043	988236	1011763	40021720	009956
21978296	990033	988262	1011737	39021703	009966
22978312	990024	988288	1011711	38021687	009975
23978329	990014	988314	1011685	37021670	009985
24978345	990004	988341	1011658	36021654	009995
25978362	989995	988367	1011632	35021637	009994
26978378	989995	988393	1011605	34021621	009994
27978395	989975	988419	1011580	33021604	009994
28978411	989966	988445	1011554	32021588	009993
29978428	989956	988471	1011528	31021571	009993
30978444	989946	988498	1011501	30021555	009993
	Sine comple.	Sine comple.	Tangent compl.	Tang.	52

37	Sine comple.	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
30	978444	989946	988499	1011501	30021555	010053
31	978461	989936	98524	1011475	29021538	010063
32	978477	989927	988550	1011449	28021522	010072
33	978494	989917	988576	1011423	27021505	010082
34	978510	989907	988602	1011397	26021489	010092
35	978526	989898	988628	1011371	25021473	010101
36	978543	989888	988654	1011345	24021456	010111
37	978559	989878	988681	1011318	23021440	010121
38	978576	989868	988707	1011292	22021423	010131
39	978592	989859	988733	1011266	21021407	010140
40	978608	989849	988759	1011240	20021391	010150
41	978625	989839	988785	1011214	19021374	010160
42	978641	989829	988811	1011188	18021358	010170
43	978657	989819	988837	1011162	17021342	010179
44	978674	989810	988863	1011136	16021325	010189
45	978690	989800	988889	1011110	15021309	010199
46	978706	989790	988916	1011083	14021293	010209
47	978723	989781	988942	1011057	13021276	010218
48	978739	989771	988968	1011031	12021260	010228
49	978755	989761	988994	1011005	11021244	010238
50	978771	989751	989020	1010979	10021227	010248
51	978788	989741	989046	1010953	9021211	010258
52	978804	989731	989072	1010927	8021195	010268
53	978820	989722	989098	1010901	7021179	010277
54	978837	989712	989124	1010875	602116	010287
55	978853	989702	989150	1010849	5021146	010297
56	978869	989692	989176	1010823	4021130	010307
57	978885	989682	989202	1010797	3021114	010317
58	978901	989672	989228	1010771	202109	010327
59	978918	989663	989254	1010745	1021081	010336
60	978934	989653	989280	1010719	0031065	010346

Sine
comple. | Sine. | Tangent
comple. | Tang. | 52

38	Sine Comple.	Tang. Complem.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si. co.
9978934	989653	989280	1010719602	0210650	010346
1978950	989643	989307	1010692	540210490	010356
2978966	989633	989333	1010666	580210330	010366
3978982	989623	989359	1010640	570210170	010376
4978998	989613	989385	1010614	560210010	010386
5979014	989603	989411	1010588	550209850	010396
6979031	989593	989437	1010562	540209680	010406
7979047	989583	989463	1010536	530209520	010416
8979063	989574	989485	1010510	520209360	010425
9979079	989564	989515	1010484	510209200	010435
10979095	989554	989541	1010458	500209040	010445
11979111	989544	989567	1010432	490208880	010455
12979127	989534	989593	1010406	480208720	010465
13979143	989524	989619	1010380	470208560	010475
14979159	989514	989645	1010354	460208400	010485
15979175	989504	989671	1010328	450208240	010495
16979191	989494	989697	1010302	440208080	010505
17979207	989484	989723	1010276	430207920	010515
18979223	989474	989749	1010250	420207760	010525
19979239	989464	989775	1010224	410207600	010535
20979255	989454	989801	1010198	400207440	010545
21979271	989444	989827	1010173	390207280	010555
22979287	989434	989852	1010147	380207120	010565
23979303	989424	989878	1010121	370206960	010575
24979319	989414	989904	1010095	360206800	010585
25979335	989404	989930	1010069	350206640	010595
26979351	989394	989956	1010043	340206480	010605
27979367	989384	989982	1010017	330206320	010615
28979383	989374	990008	1009991	320206160	010625
29979399	989364	990034	1009965	310206000	010635
30979417	989354	990060	1009939	300205850	010645

	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
3.46	30979414	989354	990060	100993930	020585010645
356	31979430	989344	990086	100991329	020569010655
366	32979446	989334	990112	100988728	020557010665
376	33979462	989324	990138	100986127	020537010675
386	34979478	989314	990164	100983526	020528010685
396	35979494	989304	990190	100980925	020509010695
406	36979510	989294	990216	100978324	020489010705
416	37979525	989283	990241	100975823	020474010716
425	38979541	989273	990267	100973222	020458010726
433	39979557	989263	990293	100970621	020442010736
445	40979573	989253	990319	100968020	020426010746
455	41979589	989243	990345	100965419	020410010756
465	42979604	989233	990371	100961818	020395010766
475	43979620	989223	990397	100960217	020379010776
485	44979636	989213	990423	100957616	020363010786
495	45979652	989203	990449	100955015	020347010796
505	46979667	989192	990474	100952514	020332010807
515	47979683	989182	990500	100949913	020316010817
525	48979699	989172	990526	100947312	020300010827
535	49979715	989162	990552	100944711	020284010837
545	50979730	989152	990578	100942110	020269010847
555	51979746	989142	990604	10093959020253	010857
565	52979762	989131	990630	10093698020237	010868
575	53979777	989121	990656	10093437020222	010878
585	54979793	989111	990681	10093186020206	010888
595	55979809	989101	990707	10092925020190	010898
605	56979824	989091	990733	10092664020175	010908
615	57979840	989080	990759	10092403020159	010919
625	58979855	989070	990785	10092142020144	010929
635	59979871	989060	990811	10091881020128	010939
645	60979887	989050	990836	10091630201120	010949

Sine
comple. | Sine. | Tang.
comple. | Tang. | 51

39	Sine comple.	Sine comple.	Tang.	Tang. comple.	com. ar. of sine.	com. ar. of sin. c.
0	979887	989050	990836	1009163	60	020112
1	979902	989040	990862	1009137	59	020097
2	979918	989029	990888	1009111	58	020081
3	979933	989019	990914	1009085	57	020066
4	979949	989009	990940	1009059	56	020050
5	979955	988999	990966	1009033	55	020034
6	979960	988938	990991	1009008	54	020019
7	979966	988978	991017	1008981	53	020003
8	980011	988968	991043	1008956	52	019988
9	980027	988957	991069	1008930	51	019972
10	980042	988947	991095	1008904	50	019957
11	980058	988937	991120	1008879	49	019941
12	980073	988927	991146	1008853	48	019926
13	980089	988916	991172	1008827	47	019910
14	980104	988906	991198	1008801	46	019895
15	980120	988896	991224	1008775	45	019879
16	980135	988885	991249	1008750	44	019864
17	980151	988875	991275	1008724	43	019848
18	980166	988865	991301	1008698	42	019833
19	980181	988854	991327	1008672	41	019818
20	980197	988844	991352	1008647	40	019803
21	980212	988834	991378	1008621	39	019787
22	980228	988823	991404	1008595	38	019771
23	980243	988813	991430	1008569	37	019756
24	980258	988803	991455	1008544	36	019741
25	980274	988792	991482	1008518	35	019725
26	980289	988782	991507	1008492	34	019710
27	980305	988771	991533	1008466	33	019694
28	980320	988761	991558	1008441	32	019679
29	980335	988751	991584	1008415	31	019664
30	980351	988740	991610	1008389	30	019648

Sine
Comple. | Sine. Tang.
Comple. | Tang. 50

	Sine Comple.	Tang. Comple.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si.co.
094	30980351	998740	991610	100838930	019648011259
095	31980366	988730	991636	100836329	019633011269
096	32980381	988719	991661	100833828	019618011280
097	33980396	988709	991687	100831227	019603011290
098	34980412	988698	991713	100828626	019587011301
099	35980427	988688	991739	100826025	019572011311
100	36980442	988678	991764	100823524	019557011321
101	37980458	988667	991790	100820923	019541011332
102	38980473	988657	991816	100818322	019526011342
103	39980488	988646	991841	100815821	019511011353
104	40980503	988636	991867	100813220	019496011363
105	41980519	988625	991893	100810619	019480011374
106	42980534	988615	991919	100808018	019465011384
107	43980549	988604	991944	100805517	019450011395
108	44980564	988594	991970	100802916	019435011405
109	45980579	988583	991996	100800315	019420011416
110	46980595	988573	992021	100797814	019404011426
111	47980610	988562	992047	100795213	019389011437
112	48980625	988552	992073	100792612	019374011447
113	49980640	988541	992098	100790111	019359011458
114	50980655	988531	992124	100787510	019344011468
115	51980670	988520	992150	10078499	019329011479
116	52980686	988510	992176	10078238	019313011490
117	53980701	988499	992201	10077987	019298011500
118	54980716	988488	992227	10077726	019282011511
119	55980731	988478	992253	10077465	019268011521
120	56980746	988467	992278	10077214	019253011532
121	57980761	988457	992304	10076953	019238011542
122	58980776	988446	992330	10076692	019223011553
123	59980791	988435	992355	10076441	019208011564
124	60980806	988425	992381	10076180	019193011574

Sine
Comple. | Sine. | Tangent
Comple. | Tang. | 50

40. Sine.	Sine Comple.	Tang.	Tang. Comple.	com. at. of sine	com. at. of sine
9980806	988425	992381	1007618	60 019193	011574
1980821	988414	992407	1007592	59 019178	011589
2980836	988404	992432	1007567	58 019163	011599
3980851	988393	992458	1007541	57 019141	011606
4980866	988382	992483	1007516	56 019133	011617
5980881	988372	992509	1007490	55 019118	011627
6980896	988361	992535	1007464	54 019103	011637
7980911	988351	992560	1007439	53 019088	011647
8980926	988340	992586	1007413	52 019073	011659
9980941	988329	992612	1007387	51 019058	011670
10980956	988319	992637	1007362	50 019043	011680
11980971	988308	992663	1007336	49 019028	011691
12980986	988297	992689	1007310	48 019013	011701
13981001	988287	992714	1007285	47 018998	011712
14981016	988276	992740	1007259	46 018983	011723
15981031	988265	992765	1007234	45 018968	011734
16981046	988254	992791	1007208	44 018953	011745
17981061	988244	992817	1007182	43 018938	011755
18981076	988233	992842	1007157	42 018923	011766
19981091	988222	992868	1007131	41 018908	011777
20981106	988212	992893	1007106	40 018893	011787
21981120	988201	992919	1007080	39 018879	011798
22981135	988190	992945	1007054	38 018864	011809
23981150	988179	992970	1007029	37 018849	011820
24981165	988169	992996	1007003	36 018834	011830
25981180	988158	993021	1006978	35 018819	011841
26981195	988147	993047	1006952	34 018804	011852
27981210	988136	993073	1006926	33 018789	011863
28981224	988126	993098	1006901	32 018775	011873
29981239	988115	993124	1006753	31 018760	011884
30981254	988104	993149	1006503	30 018745	011895

Sine
Comple. | Sine. | Tangens
Complem. | Tang. | 49

	Sine Comple.	Tang. Comple.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si.co.
157	30981234998104	993149	1006890	30018745	011895
158	31981269988093	993175	1006824	29018730	011906
159	31981284988082	993201	1006798	28018715	011917
160	33981298988072	993226	1006773	27018705	011927
161	34981313988061	993252	1006747	26018686	011938
162	35981328988050	993277	1006722	25018671	011949
163	36981343988039	993303	1006696	24018656	011960
164	37981357988028	993328	1006671	23018642	011971
165	38981372988018	993354	1006645	22018627	011981
166	39981387988007	993380	10066192	21018612	011992
167	40981401987996	993405	1006594	20018598	012003
168	41981416987985	993431	1006568	19018583	012014
169	42981431987974	993456	1006543	18018568	012025
170	43981446987963	993482	1006517	17018554	012036
171	44981460987952	993507	1006492	16018539	012047
172	45981475987941	993533	1006466	15018524	012058
173	46981489987931	993558	1006441	14018510	012068
174	47981504987920	993584	1006415	13018495	012079
175	48981519987909	993609	1006390	12018480	012090
176	49981533987898	993635	1006364	11018466	012101
177	50981548987887	993661	1006338	10018451	012112
178	51981563987876	993686	1006313	9018436	012123
179	52981577987865	993712	1006287	8018422	012134
180	53981592987854	993737	1006262	7018407	012145
181	54981606987843	993763	1006236	6018393	012156
182	55981621987832	993788	1006211	5018378	012167
183	56981636987821	993814	1006185	4018363	012178
184	57981650987810	993839	1006160	30183490	012189
185	58981665987799	993865	1006134	2018334	012200
186	59981679987788	993890	1006109	10183200	012211
187	60981694987777	993916	1006083	00183050	012222

41	Sine Compl.	Tan gent compl.	Tan gent compl.	Com. ar. of sine	Com. ar. of Si. or
0981694	987777993916	1006083	60018305	012218	09
1981708	987767993941	1006058	59018291	012233	19
2981723	987756993967	1006032	58018276	012248	29
3981737	987745993992	1006007	57018262	012253	39
4981752	987734994018	1005981	56018247	012268	49
5981766	987723994043	1005956	55018233	012273	59
6981781	987711994069	1005930	54018218	012288	69
7981795	987700994094	1005905	53018204	012299	79
8981810	987689994120	1005879	52018189	012310	89
9981814	987678994145	1005854	51018175	012321	99
10981839	987667994171	1005828	50018160	012331	109
11981853	987656994196	1005803	49018146	012343	119
12981868	987645994222	1005777	48018131	012354	129
13981882	987634994247	1005752	47018117	012365	139
14981896	987623994273	1005726	46018103	012376	149
15981911	987612994298	1005701	45018088	012387	159
16981925	987601994324	1005675	44018074	012398	169
17981940	987590994349	1005650	43018059	012409	179
18981954	987579994375	1005624	42018045	012410	189
19981968	987568994400	1005599	41018031	012431	199
20981983	987557994426	1005573	40018016	012442	209
21981997	987545994451	1005548	39018002	012453	219
22982011	987534994477	1005522	38017988	012465	229
23982026	987523994502	1005497	37017973	012476	239
24982040	987512994528	1005471	36017959	012487	249
25982054	987501994553	1005446	35017945	012498	259
26982069	987490994579	1005421	34017930	012509	269
27982083	987479994604	1005395	33017916	012510	279
28982097	987467994629	1005370	32017902	012531	289
299821112	987456994655	1005344	31017887	012543	299
309821126	987454994680	1005319	30017873	012554	309

Sine
compl.Sine
compl.Tang.
compl.Tang.
48

	Sine Comple.	Tang. Comple.	Tangent Comple.	Com. ar. of Sine.	Com. ar. of Si.co.
221	982126	987445	994680	1005319	30 017873 012554
222	982140	987434	994706	1005293	29 017859 012565
223	982155	987423	994731	1005268	28 017845 012576
224	982169	987412	994757	1005242	27 017830 012587
225	982183	987400	994782	1005217	26 017816 012599
226	982197	987389	994808	1005191	25 017802 012610
227	982211	987378	994833	1005166	24 017788 012621
228	982226	987367	994858	1005141	23 017773 012632
229	982240	987355	994884	1005115	22 017759 012644
230	982254	987344	994909	1005090	21 017745 012655
231	982268	987333	994935	1005064	20 017731 012666
232	982283	987322	994960	1005039	19 017716 012677
233	982297	987311	994986	1005013	18 017702 012688
234	982311	987299	995011	1004988	17 017688 012700
235	982325	987288	995037	1004962	16 017671 012711
236	982339	987277	995062	1004937	15 017660 012722
237	982353	987265	995087	1004912	14 017646 012734
238	982368	987254	995113	1004886	13 017632 012745
239	982382	987243	995138	1004861	12 017617 012756
240	982396	987232	995164	1004835	11 017603 012767
241	982410	987220	995189	1004810	10 017589 012779
242	982424	987209	995215	1004784	9 017575 012790
243	982438	987198	995240	1004759	8 017561 012801
244	982452	987186	995265	1004734	7 017547 012813
245	982466	987175	995291	1004708	6 017533 012824
246	982480	98716.	995316	1004683	5 017519 012835
247	982494	987153	995342	1004657	4 017505 012847
248	98250	987141	995367	1004632	3 017491 012858
249	982523	987130	995392	1004607	2 017476 012869
250	982537	987118	995418	1004581	1 017462 012881
251	982551	987107	995443	1004556	0 017448 012892
	Sine Comple.	Sine.	Tangent Complem.	Tang.	48

42	Sine Compl.	Sine Compl.	Tang. Compl.	Tangent Compl.	Com. ar. of sine	Com. ar. of sine
0982551	987107	995443	1004556	60017448	012891	
1982565	987095	995469	1004530	59017434	012904	
2982579	987084	995494	1004505	58017420	012915	
3982593	987073	995519	1004480	57017406	012926	
4982607	987061	995545	1004454	56017392	012937	
5982621	987050	995570	1004429	55017378	012949	
6982635	987038	995596	1004403	54017364	012961	
7982649	987027	995621	1004378	53017350	012971	
8982663	987016	995646	1004353	52017336	012983	
9982677	987004	995672	1004327	51017322	012995	
10982690	986993	995697	1004302	50017309	013006	
11982704	986981	995723	1004276	49017295	013018	
12982718	986970	995748	1004251	48017281	013029	
13982732	986958	995773	1004226	47017267	013041	
14982746	986947	995799	1004200	46017253	013052	
15982760	986935	995824	1004175	45017239	013064	
16982774	986924	995850	1004149	44017225	013075	
17982788	986913	995875	1004124	43017211	013086	
18982802	986901	995900	1004099	42017197	013098	
19982816	986890	995926	1004073	41017182	013109	
20982830	986878	995951	1004048	40017169	013121	
21982843	986867	995976	1004023	39017156	013133	
22982857	986855	996002	1003997	38017142	013144	
23982871	986843	996027	1003972	37017128	013156	
24982885	986832	996053	1003946	36017114	013167	
25982899	986820	996078	1003921	35017100	013179	
26982913	986809	996103	1003896	34017086	013190	
27982926	986797	996129	1003870	33017073	013202	
28982940	986786	996154	1003845	32017059	013213	
29982954	986774	996179	1003820	31017045	013225	
30982968	986763	996205	1003794	30017031	013236	

Sine
comple.Sine
comple.Tangent
comple.

Tang. 47

W. ar. Si. co.	Sine	Sine Comple.	Tang.	Tangent Complem.	Com. ar. of Sine.	Com. ar. of Si. co.
1891	42	982968	986763	996205	1003794	20017031013236
2904	31	982982	986751	996230	1003769	29017017013248
2915	32	982995	986739	996255	1003744	28017004013260
2926	33	983009	986728	996281	1003718	27016990013271
2938	34	983023	986716	996306	1003693	26016976013283
2949	35	983037	986705	996332	1003667	25016962013294
2961	36	983050	986693	996357	1003642	24016949013306
2972	37	983064	986681	996382	1003617	23016935013318
2983	38	983078	986670	996408	1003591	22016921013329
2995	39	983092	986658	996433	1003566	21016907013341
3006	40	983105	986646	996458	1003541	20016894013353
3018	41	983119	986635	996484	1003515	1901680013364
3029	42	983133	986623	996509	1003490	18016866013376
3041	43	983146	986612	996534	1003465	17016853013387
3052	44	983160	986600	996560	1003439	16016839013399
3064	45	983174	986588	996585	1003414	15016825013411
3075	46	983187	986577	996610	1003389	14016812013423
3086	47	983201	986565	996636	1003363	13016798013434
3098	48	983215	986553	996661	1003338	12016784013446
3109	49	983228	986541	996686	1003313	11016771013458
3121	50	983242	986530	996712	1003287	10016757013469
3133	51	983256	986518	996737	1003262	9016743013481
3144	52	983269	986506	996762	1003237	8016730013493
3156	53	983283	986405	996788	1003211	7016716013504
3167	54	983296	986483	996813	1003186	6016703013516
3179	55	983310	986471	996838	1003161	5016689013528
3190	56	983324	986459	999864	1003135	4016675013540
3201	57	983337	986448	996889	1003110	3016662013551
3213	58	983351	986436	996914	1003085	2016648013563
3225	59	983364	986424	996940	1003059	1016635013575
3236	60	983378	986412	996965	10030341	0016621013587

Sine
Comple. | Sine. | Tangent
Comple. | Tang. 47

43	Sine Comple.	Sine Comple.	Tang. Comple.	Tangent Comple.	com. ar. of sine	com. ar. of fi. co.
9983378	986412	996965	1003034	60	0166870	13599
1983391	986400	996990	1003009	59	0166080	13599
2983405	986389	997016	1002983	58	0165940	03610
3983418	986377	997041	1002958	57	0165810	13620
4983432	986365	997066	1002933	56	0165670	13634
5983445	986353	997092	1002907	55	0165540	13646
6983459	986341	997117	1002882	54	0165400	13658
7983472	986330	997142	1002857	53	0165270	13669
8983486	986318	997168	1002831	52	0165130	13681
9983499	986306	997193	1002806	51	0165000	13693
10983513	986296	997218	1002781	50	0164860	13705
11983526	986282	997244	1002755	49	0164730	13717
12983540	986270	997269	1002730	48	0164590	13729
13983553	986259	997294	1002705	47	0164460	13740
14983567	986247	997320	1002679	46	0164330	13752
15983580	986235	997345	1002654	45	0164190	13764
16983594	986223	997370	1002629	44	0164050	13776
17983607	986211	997396	1002603	43	0163920	13788
18983620	986199	997421	1002578	42	0163790	13800
19983634	986187	997446	1002553	41	0163650	13812
20983647	986175	997471	1002528	40	0163520	13824
21983661	986163	997497	1002502	39	0163380	13836
22983674	986151	997522	1002477	38	0163250	13848
23983687	986139	997547	1002452	37	0163120	13860
24983701	986128	997573	1002426	36	0162980	13871
25983714	986116	997598	1002401	35	0162850	13883
26983727	986104	997623	1002376	34	0162720	13895
27983741	986092	997649	1002350	33	0162580	13907
28983754	986080	997674	1002325	32	0162450	13919
29983767	986068	997699	1002300	31	0162320	13931
30983781	986056	997725	1002275	30	0162180	13943

Sine
Comple. | Sine
Comple. | Tangent
Complem. | Tang. | 46

43	Sine comple.	Tang. comple.	Tangent comple.	com. ar. of Sine.	com. ar. of fi. co.
30	983781	986056	9977725	1002275	30016218 013943
31	983794	986044	9977750	1002249	29016205 013953
32	983807	986032	9977775	1002224	28016192 013967
33	983821	986020	997800	1002199	27016178 013979
34	983834	986008	997826	1002173	26016165 013991
35	983847	985996	997851	1002148	25016152 014003
36	983860	985984	997876	1002123	24016139 014015
37	983874	985972	997902	1002097	23016125 014027
38	983887	985960	997927	1002072	22016112 014039
39	983900	985948	997952	1002047	21016099 014051
40	983913	985935	997977	1002022	20016086 014064
41	983927	985923	998000	1001996	19016072 014076
42	983940	985911	998028	1001971	18016059 014088
43	983953	985899	998053	1001946	17016046 014100
44	983966	985887	998079	1001920	16016033 014112
45	983980	985875	998104	1001895	15016019 014124
46	983993	985863	998129	1001870	14016006 014136
47	983006	985851	998155	1001844	13015993 014148
48	983019	985839	998180	1001819	12015980 014160
49	983032	985827	998205	1001794	11015967 014172
50	983045	985815	998230	1001769	10015954 014184
51	983059	985803	998256	1001743	9015940 014197
52	983072	985790	998281	1001718	8015927 014209
53	983085	985779	998306	1001693	7015914 014221
54	983098	985768	998332	1001667	6015901 014233
55	983111	985754	998357	1001642	5015888 014245
56	983124	985742	998382	1001617	4015875 014257
57	983137	985729	998407	1001592	3015862 014270
58	983150	985717	998433	1001566	2015849 014282
59	983164	985705	998458	1001541	1015835 014294
60	983177	985693	998483	1001516	0015822 014306

44	Sine comple.	Tang.	Tangent comple.	com. ex. of sine.	com. ex. of tan. co.
0	984177	985693	998483	100151660	015822014306
1	984190	985681	998509	100149159	015809014318
2	984203	985669	998534	100146558	015796014331
3	984216	985656	998559	100144057	015783014343
4	984229	985644	998584	100141556	015779014355
5	984242	985632	998610	100138955	015757014367
6	984255	985620	998635	100136454	015744014379
7	984268	985607	998660	100133953	015731014392
8	984281	985595	998685	100131452	015718014404
9	984294	985583	998711	100128851	015705014416
10	984307	985571	998736	100126350	015692014428
11	984320	985558	998761	100123849	015679014441
12	984333	985546	998787	100121248	015666014453
13	984346	985534	998812	100118747	015653014465
14	984359	985521	998837	100116246	015640014478
15	984372	985509	998862	100113745	015627014490
16	984385	985497	998888	100111144	015614014502
17	984398	985484	998913	100108643	015601014515
18	984411	985472	998938	100106142	015588014527
19	984424	985460	998963	100103641	015575014539
20	984437	985447	998989	100101040	015562014552
21	984450	985435	999014	100098539	015549014564
22	984463	985423	999039	100096038	015536014576
23	984476	985410	999065	100093437	015523014589
24	984488	985398	999090	100090936	015511014601
25	984501	985386	999115	100088435	015498014613
26	984514	985373	999140	100085934	015485014626
27	984527	985361	999166	100083333	015472014638
28	984540	985349	999191	100080832	015459014650
29	984553	985336	999216	100078331	015446014663
30	984566	985324	999241	100075830	015433014675

Sine
Comple. | Sine. | Tangent
Complem. | Tang. | 45

	Sine	Sine	Tang.	Tangent	Com. ar.	Com. ar.
	Comple.	Comple.		Comple.	of Sine.	of Si. & Co.
30	984566	985324	999241	1000758	30	015433
31	984579	985311	999267	1000732	29	015420
32	984591	985299	999292	1000707	28	015408
33	984604	985286	999317	1000682	27	015395
34	984617	985274	999343	1000656	26	015382
35	984630	985262	999368	1000631	25	015369
36	984643	985249	999393	1000606	24	015356
37	984655	985237	999418	1000581	23	015344
38	984668	985224	999444	1000555	22	015331
39	984681	985212	999469	1000530	21	015318
40	984694	985199	999494	1000505	20	015305
41	984707	985187	999519	1000480	19	015292
42	984719	985174	999545	1000454	18	015280
43	984732	985162	999570	1000429	17	015267
44	984745	985149	999595	1000404	16	015254
45	984758	985137	999621	1000379	15	015241
46	984770	985124	999646	1000353	14	015229
47	984783	985112	999671	1000328	13	015216
48	984796	985099	999696	1000303	12	015203
49	984809	985087	999722	1000277	11	015190
50	984821	985074	999747	1000252	10	015178
51	984834	985061	999772	1000227	9	015165
52	984847	985049	999797	1000202	8	015152
53	984859	985036	999823	1000176	7	015140
54	984872	985024	999848	1000151	6	015127
55	984885	985011	999873	1000126	5	015114
56	984897	984998	999898	1000091	4	015102
57	984910	984986	999924	1000075	3	015089
58	984923	984973	999949	1000050	2	015076
59	984935	984961	999974	1000025	1	015064
60	984948	984948	1000000	1000000	0	015051

Sine Sine Tang. Tang. 45
Comple. Comple.

How to examine the Truth of the foregoing Canon of Sines and Tangents.

TO the fine of any degree and minute add its Complement Arithmetical, and the sum of them shall be 999999, or rather 1000000. Also, If to the tangent of any degree and minute you add its Complement, the Summe shall be 1999999, or rather 2000000, but a Unites difference in the last place is not at all material. Thus if you doubt of the truth of any number in the Canon, you may by this rule easily discover it, or if any Figure do not appear, this rule will tell you what Figure it should be.

A

CHILIAD,
OR THE
LOGARITHMS
OF
Absolute Numbers, from an
Unite to 1000.

Chilias I.

Nú.	Logar.	Nú.	Logar.	Nú.	Logar.	Nú.	Logar.
1000000	34	153147	67	182607	100	200000	
2030103	35	154406	68	183250	101	200432	
3047712	36	155630	69	183884	102	200860	
4060206	37	156820	70	184509	103	201283	
5069897	38	157978	71	185125	104	201702	
6077815	39	159106	72	185733	105	202118	
7084509	40	160206	73	186332	106	202530	
8090309	41	161278	74	186923	107	202938	
9095424	42	162324	75	187506	108	203342	
1000000	43	163346	76	188081	109	203742	
1104139	44	164345	77	188649	110	204139	
12107918	45	145321	78	189209	111	204532	
13111394	46	166275	79	189762	112	204921	
14114612	47	167209	80	190309	113	205307	
15117609	48	168124	81	190848	114	205690	
16120412	49	169019	82	191381	115	206069	
17123044	50	169897	83	191907	116	206445	
18125527	51	170757	84	192427	117	206818	
19127875	52	171600	85	192941	118	207188	
20130103	53	172427	86	193449	119	207554	
21132221	54	173239	87	193951	120	207918	
22134242	55	174036	88	194448	121	208278	
23136172	56	174818	89	194939	122	208635	
24138021	57	175587	90	195424	123	208990	
25139794	58	176342	91	195904	124	209342	
26141497	59	17705	92	196378	125	209691	
27143136	60	177815	93	196848	126	210037	
28144715	61	178532	94	197312	127	210380	
29146239	62	179239	95	197772	128	210720	
30147712	63	179934	96	198227	129	211058	
31149136	64	180618	97	198677	130	211394	
32150515	65	181291	98	199122	131	211727	
33151851	66	181954	99	199563	132	212057	

Chilias 1.

Nú.	Logar.								
133	212385	166	222010	199	229885	232	236548		
134	212710	167	222271	200	230103	233	236735		
135	213033	168	222530	201	230319	234	236921		
136	213353	169	222788	202	230535	235	237106		
137	213672	170	223044	203	230749	236	237291		
138	213987	171	223299	204	230963	237	237474		
139	214301	172	223552	205	231175	238	237657		
140	214612	173	223804	206	231386	239	237839		
141	214921	174	224054	207	231597	240	238021		
142	215228	175	224203	208	231806	241	238201		
143	215533	176	224551	209	232014	242	238381		
144	215836	177	224799	210	232221	243	238560		
145	216136	178	225042	211	232428	244	238738		
146	216435	179	225285	212	232633	245	238916		
147	216721	180	225527	213	232837	246	239093		
148	217026	181	225767	214	233041	247	239269		
149	217318	182	226007	215	233243	248	239445		
150	217609	183	226245	216	233445	249	239619		
151	217897	184	226481	217	233645	250	239794		
152	218184	185	226717	218	233845	251	239967		
153	218469	186	226951	219	234044	252	240140		
154	218752	187	227184	220	234242	253	240312		
155	219033	188	227415	221	234439	254	240483		
156	219312	189	227646	222	234635	255	240654		
157	219589	190	227875	223	234830	256	240824		
158	219865	191	228103	224	235024	257	240993		
159	220139	192	228330	225	235218	258	241161		
160	220412	193	228555	226	235410	259	241329		
161	220682	194	228780	227	235602	260	241497		
162	220951	195	229003	228	235793	261	241664		
163	221218	196	229225	229	235983	262	241830		
164	221484	197	229446	230	236172	263	241995		
165	221748	198	229666	231	236361	264	242160		

Chilias 1.

Nü.	Logar.	Nü.	Logar.	Nü.	Logar.	Nü.	Logar.
165	242324	298	247421	331	251982	364	256110
166	242488	299	247565	332	252113	365	256229
167	242651	300	247712	333	252244	366	256348
168	242813	301	247856	334	252374	367	256466
169	242975	302	248000	335	252504	368	256584
170	243136	303	248144	336	252633	369	256702
171	243296	304	248287	337	252762	370	256820
172	243456	305	248429	338	252891	371	256937
173	243616	306	248572	339	253019	372	257054
174	243775	307	248713	340	253147	373	257173
175	243933	308	248853	341	253275	374	257287
176	244090	309	248995	342	253402	375	257403
177	244247	310	249136	343	253529	376	257518
178	244404	311	249276	344	253655	377	257634
179	244560	312	249415	345	253781	378	257749
180	244715	313	249554	346	253907	379	257863
181	244870	314	249692	347	254032	380	257978
182	245024	315	249831	348	254157	381	258093
183	245178	316	249968	349	254282	382	258206
184	245331	317	250105	350	254406	383	258319
185	245484	318	250242	351	254530	384	258433
186	245636	319	250379	352	254654	385	258546
187	245788	320	250515	353	254777	386	258658
188	245939	321	250650	354	254900	387	258771
189	246089	322	250785	355	255022	388	258883
190	246239	323	250920	356	255145	389	258994
191	246389	324	251054	357	255266	390	259106
192	246539	325	251183	358	255388	391	259217
193	246686	326	251321	359	255509	392	259328
194	246834	327	251454	360	255630	393	259439
195	246982	328	251587	361	255750	394	259549
196	247129	329	251719	362	255870	395	259659
197	247275	330	251851	363	255990	396	259769

Chilias 1.

Nú.	Logar.	Nú.	Logar.	Nú.	Logar.	Nú.	Logar.
397	259879	430	263346	463	266558	496	269541
398	259988	431	263447	464	266651	497	269630
399	260097	432	263548	465	266745	498	269721
400	260206	433	263648	466	266838	499	269810
401	260314	434	263748	467	266931	500	269901
402	260422	435	263848	468	267024	501	269981
403	260530	436	263948	469	267117	502	260070
404	260638	437	264048	470	267209	503	260156
405	260745	438	264147	471	267302	504	260243
406	260852	439	264246	472	267394	505	260331
407	260959	440	264345	473	267486	506	260419
408	261066	441	264443	474	267577	507	260500
409	261172	442	264542	475	267669	508	260580
410	261278	443	264640	476	267760	509	260671
411	261384	444	264738	477	267851	510	260757
412	261489	445	264836	478	267942	511	260842
413	261595	446	264933	479	268033	512	260926
414	261700	447	265030	480	268124	513	261011
415	261804	448	265127	481	268214	514	261096
416	261829	449	265224	482	268304	515	261180
417	262013	450	265321	483	268394	516	261264
418	262117	451	265417	484	268484	517	261349
419	262221	452	265513	485	268574	518	261434
420	262324	453	265609	486	268663	519	261516
421	262427	454	265705	487	268752	520	261600
422	262531	455	265801	488	268841	521	261683
423	262634	456	265896	489	268930	522	261767
424	262736	457	265991	490	269019	523	261850
425	262838	458	266086	491	269108	524	261933
426	262940	459	266181	492	269196	525	262016
427	263042	460	266275	493	269284	526	262098
428	263144	461	266370	494	269372	527	262181
429	262245	462	266464	495	269460	528	262266

Chilias I.

Nü.	Logar.	Nü.	Logar.	Nü.	Logar.	Nü.	Logar.
529	272345	562	274973	595	277451	628	279765
530	272427	563	275050	596	277524	629	279865
531	272509	564	275127	597	277597	630	279934
532	272591	565	275204	598	277670	631	280002
533	272672	566	275281	599	277742	632	280071
534	272754	567	275358	600	277815	633	280140
535	272835	568	275434	601	277887	634	280208
536	272916	569	275511	602	277959	635	280277
537	272997	570	275687	603	278031	636	280345
538	273078	571	275663	604	278103	637	280413
539	273158	572	275739	605	278175	638	280482
540	273239	573	275815	606	278247	639	280550
541	273319	574	275891	607	278318	640	280618
542	273399	575	275966	608	278390	641	280685
543	273479	576	276042	609	278461	642	280753
544	273559	577	276117	610	278532	643	280821
545	273639	578	276192	611	278604	644	280888
546	273719	579	276267	612	278675	645	280955
547	273798	580	276342	613	278746	646	281023
548	273878	581	276417	614	278816	647	281090
549	273957	582	276492	615	278887	648	281157
550	274036	583	276566	616	278958	649	281224
551	274115	584	276641	617	279028	650	281291
552	274193	585	276715	618	279098	651	281358
553	274272	586	276789	619	279169	652	281424
554	274350	587	276863	620	279239	653	281491
555	274429	588	276937	621	279309	654	281557
556	274507	589	277011	622	279379	655	281624
557	274585	590	277085	623	279448	656	281690
558	274663	591	277158	624	279518	657	281756
559	274741	592	277232	625	279588	658	281832
560	274818	593	277305	626	279657	659	281888
561	274896	594	277378	627	279736	660	281954

Chiffas 1.

Nú.	Logar.	Nú.	Logar.	Nú.	Logar.	Nú.	Logar.
661	282020	694	284135	727	286153	760	288081
662	282085	695	284198	728	286213	761	288138
663	282151	696	284260	729	286272	762	288195
664	282216	697	284323	730	286332	763	288252
665	282282	698	284385	731	286391	764	288309
666	282347	699	284447	732	286451	765	288366
667	282412	700	284509	733	286510	766	288422
668	282477	701	284571	734	286569	767	288479
669	282542	702	284633	735	286628	768	288536
670	282607	703	284695	736	286687	769	288593
671	282672	704	284757	737	286746	770	288649
672	282736	705	284818	738	286805	771	288705
673	282801	706	284880	739	286864	772	288761
674	282865	707	284941	740	286923	773	288817
675	282930	708	285003	741	286981	774	288874
676	282994	709	285064	742	287040	775	288930
677	283058	710	285125	743	287098	776	288986
678	283122	711	285186	744	287157	777	289041
679	283186	712	285248	745	287215	778	289097
680	283250	713	285308	746	287273	779	289153
681	283314	714	285369	747	287332	780	289209
682	283378	715	285430	748	287390	781	289265
683	283442	716	285491	749	287448	782	289320
684	283505	717	285551	750	287506	783	289376
685	283569	718	285612	751	287565	784	289431
686	283632	719	285672	752	287621	785	289486
687	283695	720	285733	753	287679	786	289542
688	283758	721	285793	754	287737	787	289597
689	283821	722	285853	755	287791	788	289652
690	283884	723	285913	756	287852	789	289707
691	283947	724	285973	757	287909	790	289761
692	284010	725	286033	758	287966	791	289817
693	284073	726	286093	759	288024	792	289872

Chilias 1.

Nú.	Logar.	Nú.	Logar.	Nú.	Logar.	Nú.	Logar.
793	289927	826	291698	859	293399	892	295036
794	289982	827	291750	860	293449	893	295085
795	290036	828	291803	861	293500	894	295133
796	290091	829	291855	862	293550	895	295182
797	290145	830	291907	863	293601	896	295230
798	290200	831	291960	864	293651	897	295279
799	290254	832	292012	865	293701	898	295327
800	290309	833	292064	866	293751	899	295375
801	290363	834	292116	867	293801	900	295424
802	290417	835	292168	868	293851	901	295472
803	290471	836	292220	869	293901	902	295520
804	290525	837	292272	870	293951	903	295568
805	290579	838	292324	871	294001	904	295616
806	290633	839	292376	872	294051	905	295664
807	290687	840	292427	873	294101	906	295712
808	290741	841	292479	874	294151	907	295760
809	290794	842	292531	875	294200	908	295808
810	290848	843	292582	876	294250	909	295856
811	290902	844	292634	877	294299	910	295904
812	290955	845	292685	878	294349	911	295951
813	291009	846	292737	879	294398	912	295999
814	291062	847	292788	880	294448	913	296047
815	291115	848	292839	881	294497	914	296094
816	291169	849	292890	882	294546	915	296142
817	291222	850	292941	883	294596	916	296189
818	291275	851	292992	884	294645	917	296236
819	291328	852	293043	885	294694	918	296284
820	291381	853	293094	886	294743	919	296331
821	291434	854	293145	887	294792	920	296378
822	291487	855	293196	888	294841	921	296425
823	291539	856	293247	889	294890	922	296473
824	291592	857	293298	890	294939	923	296520
825	291645	858	293348	891	294987	924	296567

Chilias 1.

Nú.	Logar.	Nú.	Logar.	Nú.	Logar.	Nú.	Logar.
925	296614	944	297497	963	298362	982	299211
926	296661	945	297543	964	298407	983	299255
927	296707	946	297589	965	298452	984	299299
928	296754	947	297635	966	298497	985	299343
929	296801	948	297680	967	298542	986	299387
930	296848	949	297726	968	298587	987	299431
931	296894	950	297772	969	298632	988	299475
932	296941	951	297818	970	298677	989	299519
933	296988	952	297863	971	298721	990	299563
934	297034	953	297909	972	298766	991	299607
935	297081	954	297954	973	298811	992	299951
936	297127	955	298955	974	298855	993	299674
937	297173	956	298956	975	298900	994	299738
938	297220	957	298957	976	298944	995	299782
939	297266	958	298958	977	298989	996	299825
940	297312	959	298959	978	299033	997	299869
941	297358	960	298960	979	299078	998	299913
942	297405	961	298961	980	299122	999	299956
943	297451	962	298962	981	299166	1000	300000

FINIS.

211
255
299
343
387
431
475
519
563
607
951
674
738
782
825
869
913
956
090

Certain Necessary

TABLES USEFUL In the Art OF NAVIGATION.

A Table of Meridional parts.

Latit.	lat			lat			lat		
	D.	I.M.	D.parts.	D.	D.parts.	D.	D.parts.	D.	D.parts.
0 00	0	000	5	5	006	10	10	051	15
10	0	167	5	5	174	10	220	15	347
20	0	333	5	5	341	10	390	15	519
30	0	500	5	5	508	10	559	15	692
40	0	667	5	5	676	10	729	15	865
50	0	833	5	5	843	10	898	16	038
1 00	1	000	6	6	011	11	068	16	212
10	1	166	6	6	179	11	238	16	385
20	1	333	6	6	346	11	408	16	519
30	1	500	6	6	514	11	578	16	673
40	1	667	6	6	682	11	748	16	806
50	1	833	6	6	849	11	918	17	081
2 00	2	000	7	7	017	12	089	17	255
10	2	167	7	7	186	12	259	17	429
20	2	334	7	7	353	12	429	17	604
30	2	501	7	7	521	12	600	17	778
40	2	668	7	7	690	12	771	17	953
50	2	834	7	7	858	12	942	18	128
3 00	3	001	8	8	026	13	113	18	303
10	3	169	8	8	155	13	284	18	478
20	3	335	8	8	363	13	455	18	654
30	3	503	8	8	531	13	627	18	830
40	3	669	8	8	700	13	798	19	005
50	3	836	8	8	868	13	969	19	181
4 00	4	003	9	9	037	14	141	19	358
10	4	171	9	9	106	14	313	19	535
20	4	337	9	9	375	14	485	19	710
30	4	505	9	9	544	14	657	19	887
40	4	672	9	9	713	14	829	20	065
50	4	839	9	9	882	15	001	20	241
5 00	5	006	10	10	051	15	174	20	415

A Table of Meridional parts.

Latit.	lat	lat	lat
D. M.	D. parts.	D. M.	D. parts.
174	20 00 20	419 25	25 833 30
347	10 20 596	26 017	31 664
519	20 20 774	26 200	31 857
692	30 20 952	26 386	32 051
865	40 21 130	26 570	32 244
038	50 21 308	26 755	32 438
212	21 00 21	486	26 941
385	10 21 665	27 126	32 827
559	20 31 844	27 312	33 022
733	30 22 023	27 49	33 218
906	40 22 202	27 685	33 413
081	50 22 381	27 871	33 609
255	22 00 22	561	28 058
429	10 22 741	28 245	32 805
604	20 22 921	28 432	34 002
778	30 22 101	28 620	34 199
953	40 23 282	28 800	34 397
128	50 23 462	28 997	34 595
303	23 00 33	132	29 185
478	10 23 814	29 374	33 34991
654	20 24 006	29 563	34 991
830	30 24 188	29 753	35 136
005	40 24 369	29 943	35 348
181	50 24 551	30 133	35 560
358	24 00 24	734	29 30 323
535	10 24 916	30 514	34 35 190
710	20 25 099	30 705	35 389
887	30 25 282	30 896	35 589
065	40 25 465	31 088	35 789
241	50 25 648	31 279	35 990
415	25 00 25	833	30 31 472

A Table of Meridional parts.

Latit.	lat	lat	lat
D. M.	D. parts.	D.	D. parts.
40 00	43 710	45 50	49 750
10 43	928	50 733	58 165
20 44	146	50 970	58 425
30 44	365	51 207	58 687
40 44	584	51 445	58 949
50 44	804	51 684	59 212
41 00	45 025	46 51	59 477
10 45	246	52 164	59 743
20 45	467	52 405	60 008
30 45	689	52 647	60 276
40 45	912	52 889	60 544
50 46	136	53 132	60 813
42 00	46 360	47 53 376	61 083
10 46	585	53 621	61 314
20 46	810	53 867	61 626
30 47	036	54 113	61 900
40 47	262	54 360	62 174
50 47	489	54 608	62 449
43 00	47 717	48 54 856	62 726
10 47	945	55 106	63 004
20 48	174	55 356	63 282
30 48	403	55 607	63 562
40 48	613	55 859	63 842
50 48	864	56 112	64 124
44 00	49 095	49 56 365	64 407
10 49	327	56 620	64 691
20 49	560	56 875	64 976
30 49	793	57 131	65 263
40 50	037	57 389	65 550
50 50	262	57 646	65 839
50 50	497	50 57 905	66 129
		55 66	60 75 491

A Table of Meridional parts.

Latit.	lat	lat	lat
D. M.	D. parts.	D.	D. parts.
60 00 75	45 16 5	86 30 7 0	99 42 7 5
10 75	78 5	86 7 0 2	99 9 1
20 76	12 1	87 10 0	100 4 1
30 76	45 9	87 5 0 1	100 9 0
40 76	79 8	87 9 0 4	101 4 0
50 77	13 9	88 3 0 9	101 9 1
61 00	77 48 2 6 6	88 7 1 8 7 1	102 42 7 6 2 20 1 5
10 77	82 6	89 1 2 9	102 9 3
20 78	17 3	89 5 4 3	103 4 5
30 78	5 2 1	89 9 5 9	103 9 7
40 78	8 7 1	90 3 7 8	104 5 0
50 79	2 2 3	90 8 0 1	105 0 3
62 00	79 5 7 7 6	91 2 2 6 7 2	105 5 7 7 7 1 2 4 4 4
10 79	9 3 4	91 6 5 4	106 1 1
20 80	2 9 1	92 0 8 4	106 6 6
30 80	6 5 1	92 5 1 8	107 2 1
40 81	0 1 3	92 9 5 5	107 7 7
50 81	3 7 7	93 3 9 5	108 3 3
63 00	8 1 7 4 3 6 8	93 8 2 9 7 3	108 9 0 7 8 1 2 9 0 6
10 82	1 1 1	94 2 8 5	109 4 7
20 82	4 8 1	94 7 3 4	110 0 5
30 82	8 5 4	95 1 8 8	110 6 3
40 83	2 2 8	95 6 4 4	111 2 2
50 83	6 0 5	96 1 0 3	111 8 2
64 00	8 3 9 8 4 6 9 9 5	96 5 6 7 7 4	112 4 2 7 9 1 3 4 0 7
10 84	3 6 5	97 0 3 4	113 0 2
20 84	7 4 9	97 5 0 4	113 6 4
30 85	1 3 5	97 9 7 8	114 2 6
40 85	5 2 3	98 4 5 6	114 8 8
50 85	9 1 3	98 9 3 6	115 5 2
65 00	8 6 3 0 7 7 0 9 9 4 2 2	7 5	116 1 6 8 0 1 3 9 5 6

The first Table of Rums.

Lgs.	100	80	60	40	D	19	18	17	19	D
Rums.	G.	M.	lg.	m.	lg.	m.	m.	m.	m.	m.
1	4	59	3	59	2	59	1	59	60	57
	4	58	3	58	2	59	1	59	60	57
	4	56	3	57	2	58	1	58	59	56
	4	54	3	55	2	56	1	57	59	56
	4	51	3	53	2	55	1	56	58	56
	4	47	3	50	2	52	1	55	57	55
	4	42	3	46	2	49	1	53	56	54
2	4	37	3	42	2	46	1	51	55	53
	4	31	3	37	2	43	1	48	54	52
	4	25	3	32	2	39	1	46	53	50
	4	17	3	26	2	34	1	43	51	49
3	4	10	3	20	2	30	1	40	50	47
	4	01	3	13	2	25	1	36	48	46
	3	52	3	05	2	19	1	32	46	44
	3	42	2	58	2	13	1	28	44	42
	4	32	2	50	2	07	1	25	42	40
	3	22	2	41	2	01	1	21	40	38
	3	10	2	32	1	54	1	16	38	36
	2	59	2	23	1	47	1	12	36	34
5	2	47	2	14	1	40	1	07	33	32
	2	34	2	03	1	32	1	02	31	29
	2	22	1	53	1	25	0	57	28	27
	2	18	1	43	1	17	0	52	26	24
6	1	55	1	32	1	08	0	46	23	22
	1	41	1	20	1	40	0	40	20	19
	1	27	1	09	0	52	0	35	17	16
	1	13	0	58	0	44	0	30	15	14
7	0	59	0	47	0	35	0	24	12	11
	0	44	0	36	0	26	0	18	09	08
	0	30	0	24	0	18	0	12	06	06
	0	15	0	12	0	09	0	06	03	03

to find the difference of Latitudes.

91 D	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Lgs
m. m.	m. m.	m. m.	m. m.	m. m.	m. m.	m. m.	m. m.	m. m.	Rums.						
48 45	42	39 36	33 30	27 24	21	18 15	12 09 06	03							
48 45	42	39 36	33 30	27 24	21	18 15	12 09 06	03							
47 44	42	39 36	33 30	27 24	21	18 15	12 09 06	03							
47 44	42	39 36	33 30	27 24	21	18 15	12 09 06	03							
47 43	41	38 35	32 29	26 24	21	18 15	12 09 06	03							1
46 43	41	38 35	32 29	26 23	20	17 15	12 09 06	03							
45 42	40	37 34	32 29	26 23	20	17 14	11 09 06	03							
44 41	40	37 34	31 28	25 23	20	17 14	11 08 06	03							
43 40	39	36 33	31 28	25 22	19	17 14	11 08 06	03							2
42 39	38	35 33	30 27	24 22	19	16 14	11 08 05	03							
41 38	37	34 32	29 26	24 21	19	16 13	11 08 05	03							
40 37	36	33 31	28 26	23 21	18	15 13	10 08 05	03							
39 36	35	32 30	27 25	22 20	17	15 12	10 07 05	02							3
38 35	34	31 29	26 24	22 19	17	14 12	10 07 05	02							
37 33	33	30 28	26 23	21 19	16	14 12	09 07 05	02							
36 32	31	29 27	24 22	20 18	16	13 11	09 07 04	02							
35 30	20	29 25	23 21	19 17	15 13	11 08 06	04	02							4
34 28	28	26 24	22 20	18 16	14 12	10 08 06	04	02							
33 27	27	25 23	21 19	17 15	13 11	10 08 06	04	02							
32 25	25	23 21	20 18	16 14	13 11	09 07 05	02								
31 23	23	22 20	19 17	15 13	12 10	08 07 05	03	02							5
30 22	22	20 18	17 15	14 12	11 09	08 06 03	02	02							
29 19	20	18 17	16 14	13 11	10 08	07 06 04	02	01							
28 17	18	17 15	14 13	12 10	09 08	06 05 04	03	01							
27 15	16	15 14	13 11	10 09	08 06	05 04 03	02	01							
26 15	15	14 13	11 10	09 08	06 05	04 03 02	01	01							6
25 13	14	13 12	11 10	09 08	07 06	05 04 03	02	01							
24 11	12	11 10	10 09	08 07	06 05	04 03 02	01	01							
23 09	10	10 09	08 07	06 05	04 03	04 03 02	01	01							
22 07	09	09 08	07 06	05 04	03 03	03 02 01	01	01							7
21 04	08	08 07	06 05	04 03	03 02	02 01 01	01	01							
20 02	06	06 05	05 04	04 03	03 02	02 01 01	01	01							
19 02	04	04 04	03 03	02 02	02 01	01 01 01	01	00							
18 02	02	02 02	01 01	01 01	01 01	01 01 01	01	00							

The second Table of Rums.

Latit.	First	Second	Third	Fourth				
Lat.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
0° 100	02 2	0	04 4	0	07 6	0	10 10	
200	04 2	0	08 4	0	13 7	0	20 10	
300	06 2	0	12 4	0	20 7	0	30 10	
400	08 2	0	16 4	0	27 6	0	40 10	
500	10 2	0	20 5	0	33 7	0	50 10	
1 000	12 2	0	25 4	0	40 7	1	60 10	
100	14 2	0	29 4	0	47 6	1	10 10	
200	16 2	0	33 4	0	53 7	1	30 10	
300	18 2	0	37 4	1	00 7	1	30 10	
400	20 2	0	41 4	1	07 6	1	40 10	
500	22 2	0	45 5	1	13 7	1	50 10	
2 000	24 2	0	50 4	1	20 7	2	00 10	
100	26 2	0	54 4	1	27 6	2	10 10	
200	28 2	0	58 4	1	33 7	2	20 10	
300	30 2	1	02 4	1	40 7	2	30 10	
400	32 2	1	06 4	1	47 6	2	40 10	
500	34 2	1	10 5	1	53 7	2	50 10	
3 000	36 2	1	15 4	2	00 7	3	00 10	
100	38 2	1	19 4	2	07 6	3	10 10	
200	40 2	1	23 4	2	13 7	3	20 10	
300	42 2	1	27 4	2	20 7	3	30 10	
400	44 2	1	31 4	2	27 6	3	40 10	
500	46 2	1	35 4	2	33 7	3	50 10	
4 000	48 2	1	39 4	2	40 7	4	00 10	
100	50 2	1	43 5	2	47 7	4	10 10	
200	52 2	1	48 4	2	54 6	4	20 10	
300	54 2	1	52 4	3	00 7	4	30 10	
400	56 2	1	56 4	3	07 7	4	40 10	
500	58 2	1	00 4	3	14 7	4	50 10	
5 000	00 2	1	04 4	3	21 6	5	00 10	

to find the difference of Longitudes.

Latit.		Fift		Sixt		Seventh	
gr.	m.	Longit.	dif.	Longit.	dif.	Longit.	dif.
10	0000	15	15	00	24	24	00
10	2000	30	15	00	48	24	01
10	3000	45	15	01	12	24	02
10	4001	00	15	01	36	24	03
10	5001	15	15	02	00	25	04
10	10001	29	14	02	25	24	05
10	1001	44	15	02	49	24	05
10	2001	59	15	03	13	24	06
10	3002	14	15	03	37	24	07
10	4002	29	15	04	01	24	08
10	5002	44	15	04	25	25	09
10	20002	59	15	04	50	24	10
0	1003	14	15	05	14	24	10
0	2003	29	15	05	38	24	11
0	3003	44	15	06	02	34	12
0	4003	59	15	06	26	24	13
0	5004	14	15	06	50	25	14
0	30004	29	15	07	15	24	15
0	1004	44	15	07	39	24	15
0	2004	59	15	08	03	24	16
0	3005	14	15	08	27	24	17
0	4005	29	15	08	51	24	18
0	5005	44	16	09	15	25	19
0	40006	00	15	09	40	24	20
0	1006	15	15	10	04	24	20
0	2006	30	15	10	28	24	21
0	3006	45	15	10	53	24	22
0	4007	00	15	11	17	24	23
0	5001	15	15	11	41	25	24
0	50007	30	15	12	50	24	25
0							1051

The second Table of Rums.

Latit.	First		Second		Third		Fourth	
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
5° 10' 1	02	2	05	4	3	27	7	5
20	1	94	2	12	4	3	34	7
30	1	06	2	16	3	41	7	5
40	1	08	2	20	3	48	6	5
50	1	10	2	25	4	54	7	5
60	1	12	2	29	4	01	6	6
—								
10	1	14	2	3	5	4	07	7
20	1	16	2	3	8	4	14	7
30	1	18	2	4	2	4	21	7
40	1	20	2	4	6	4	28	6
50	1	22	2	5	0	2	34	7
70	1	24	2	5	5	4	41	7
—								
10	1	26	2	5	9	4	48	7
20	1	28	2	3	0	4	55	7
30	1	30	2	3	0	7	52	7
40	1	32	2	3	1	4	59	6
50	1	34	2	3	1	4	15	7
80	1	36	2	3	1	9	5	22
—								
10	1	38	2	3	2	4	59	7
20	1	40	2	3	2	8	36	6
30	1	42	2	3	3	2	42	7
40	1	44	2	3	3	6	49	6
50	1	46	2	3	4	0	55	7
90	1	48	2	3	4	4	02	7
—								
10	1	50	2	3	4	9	09	7
20	1	52	2	3	5	3	16	7
30	1	54	2	3	5	7	23	7
40	1	56	2	4	0	1	30	6
50	1	58	2	4	0	6	36	7
10.00	2	00	2	4	1	0	43	7
							10	03

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh			
m.	Long.	dif.	Long.	dif.	Long.	dif.
50 07	45 15	12 29 24	26 01 50			
50 08	00 15	12 53 25	26 51 50			
30 08	15 15	13 18 24	27 41 51			
40 08	30 15	13 42 24	28 32 51			
50 08	44 15	14 06 25	29 23 50			
60 09	00 15	14 31 24	30 13 51			
10 09	15 15	14 55 24	31 04 50			
20 09	30 15	15 19 25	31 54 51			
30 09	45 15	15 44 24	32 45 50			
40 10	00 15	16 08 24	33 35 50			
50 10	15 15	16 32 24	34 25 51			
70 10	30 15	16 56 24	35 16 51			
10 10	45 15	17 20 24	36 07 51			
20 11	00 15	17 44 25	36 58 51			
30 11	15 15	18 09 24	37 49 50			
40 11	30 15	18 33 24	38 39 50			
50 11	45 16	18 57 25	39 29 51			
80 12	01 15	19 22 24	40 20 51			
10 12	10 15	19 46 25	41 11 51			
20 12	31 15	20 11 25	42 02 51			
30 12	46 15	20 36 24	42 53 50			
40 13	01 15	21 00 24	43 43 51			
50 13	16 15	21 24 25	44 34 51			
90 13	31 15	21 49 24	45 25 51			
10 13	46 15	22 13 24	46 16 51			
20 14	01 15	22 37 25	47 07 51			
30 14	16 16	23 02 24	47 58 51			
40 14	32 15	23 26 25	48 49 51			
50 14	47 15	23 51 25	49 40 51			
100 15	02 15	24 16 24	50 31 51			

H

The second Table of Rums.

Latit.	First	Second	Third	Fourth	Latit.	
gr. m.	Long.	dif.	Long.	dif.	Long.	
10 10 2	02 2	4	14 4	6	50 7	10 13 10
20 2	04 2	4	18 4	6	57 6	10 23 11
30 2	06 2	4	22 4	7	03 7	10 34 10
40 2	08 2	4	26 5	7	10 7	10 44 10
50 2	10 2	4	31 4	7	17 6	10 54 10
11 00 2	12 2	4	35 4	7	23 7	11 04 10
10 2	14 2	4	39 4	7	30 7	11 14 10
20 2	16 2	4	43 5	7	37 7	11 24 11
30 2	18 2	4	48 4	7	44 7	11 35 10
40 2	20 2	4	52 4	7	51 7	11 45 10
50 2	22 2	4	56 5	7	58 6	11 55 10
12 00 2	24 2	5	01 4	8	04 7	12 05 10
10 2	26 2	5	05 4	8	11 7	12 15 10
20 2	28 2	5	09 4	8	18 7	12 25 11
30 2	30 2	5	13 5	8	25 7	12 36 10
40 2	32 2	5	18 4	8	32 7	12 46 10
50 2	34 2	5	22 4	8	39 7	12 56 11
13 00 2	37 2	5	26 4	8	46 6	13 07 10
10 2	39 2	5	30 4	8	52 7	13 17 10
20 2	41 2	5	34 4	8	59 7	13 27 11
30 2	43 2	5	38 5	9	06 7	13 38 10
40 2	45 2	5	43 4	9	13 7	13 48 10
50 2	47 2	5	47 4	9	20 7	13 58 10
14 00 2	49 2	5	51 4	9	27 7	14 08 10
10 2	51 2	5	55 5	9	34 7	14 18 10
20 2	53 2	6	00 4	9	41 7	14 28 11
30 2	55 2	6	04 4	9	48 6	14 39 10
40 2	57 2	6	08 5	9	54 7	14 49 10
50 2	59 2	6	13 4	10	01 7	14 59 11
15 00 3	01 2	6	17 4	10	68 7	15 10 10

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh
gr. m.	Long. dif.	Long. dif.	Long. dif.
3° 10'	10 15 17 15	24 40 24	51 22 52
3° 11'	20 15 32 16	25 04 25	52 14 51
4° 10'	30 15 48 15	25 29 24	53 05 51
4° 11'	40 16 03 15	25 53 25	53 56 51
4° 10'	50 16 18 16	26 18 25	54 47 51
4° 11'	11 05 16 34 15	26 43 24	55 38 51
4° 10'	10 16 49 16	27 07 25	56 29 51
4° 11'	20 17 09 15	27 32 25	57 20 52
5° 10'	30 17 20 15	27 57 24	58 12 51
5° 11'	40 17 35 15	28 21 24	59 03 51
5° 10'	50 17 50 15	28 45 25	59 54 52
5° 11'	12 00 18 05 15	29 10 25	60 46 51
5° 10'	10 18 20 15	29 35 25	61 37 51
5° 11'	20 18 25 16	30 00 25	62 28 52
6° 10'	30 18 51 15	30 25 24	63 20 51
6° 11'	40 19 06 15	30 49 25	64 11 52
6° 11'	50 19 21 16	31 14 25	65 03 52
7° 10'	13 00 19 37 15	31 39 25	65 55 52
7° 10'	10 19 52 16	32 04 25	66 47 51
7° 11'	20 20 08 15	32 29 25	67 38 52
8° 10'	30 20 23 15	32 54 24	68 30 51
8° 10'	40 20 38 16	33 18 25	69 21 52
8° 10'	50 20 54 16	33 43 25	70 13 52
8° 11'	14 00 21 10 15	34 08 25	71 05 52
8° 11'	10 21 25 15	34 33 25	71 57 52
9° 10'	20 21 40 16	34 58 25	72 49 52
9° 10'	30 21 56 15	35 23 25	73 41 52
9° 11'	40 22 11 15	35 48 25	74 33 52
9° 11'	50 22 26 16	36 13 25	75 25 52
10° 10'	15 00 22 42 15	36 38 25	76 17 52

The second Table of Rumbas.

Latit. gr. m.	First		Second		Third		Fourth	
	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
15	10 3	03 3	6	21 5	10	15 7	15	20 10
	20 3	05 2	6	25 4	10	22 7	15	30 11
	30 3	07 2	6	30 4	10	29 7	15	41 11
	40 3	09 2	6	34 5	10	36 7	15	54 10
	50 3	11 2	6	39 4	10	43 7	16	02 11
16 00	3	13 2	6	43 4	10	50 7	16	13 10
	10 3	15 2	6	47 4	10	57 7	16	23 10
	20 3	17 2	6	51 5	11	04 7	16	33 11
	30 3	19 3	6	56 4	11	11 7	16	44 10
	40 3	21 2	7	00 4	11	18 7	16	54 10
	50 3	24 2	7	04 4	11	25 7	17	04 11
17 00	3	26 2	7	08 5	11	32 7	17	15 10
	10 3	28 2	7	13 4	11	39 7	17	25 10
	20 3	30 2	7	17 4	11	46 7	17	35 11
	30 3	32 2	7	21 5	11	53 7	17	46 10
	40 3	34 2	7	26 4	12	00 7	17	56 11
	50 3	36 3	7	30 5	12	07 7	18	07 11
18 00	3	38 2	7	35 4	12	14 7	18	18 10
	10 3	40 2	7	39 4	12	21 7	18	28 11
	20 3	42 2	7	43 4	12	28 7	18	39 11
	30 3	44 2	7	47 5	12	35 7	18	50 10
	40 3	46 2	7	52 5	12	42 7	19	00 10
	50 3	49 2	7	57 4	12	49 7	19	10 11
19 00	3	51 2	8	01 4	12	56 7	19	21 10
	10 3	53 2	8	05 5	13	03 7	19	31 11
	20 3	55 2	8	10 4	13	10 7	19	42 11
	30 3	57 2	8	14 4	13	17 7	19	53 10
	40 3	59 2	8	18 5	13	24 7	20	03 11
	50 4	01 2	8	23 4	13	31 7	20	14 11
20 00	4	04 2	8	27 5	13	38 7	20	25 10

to find the difference of Longitudes.

Latit.	Fift	Sixt	seventh
gr. m.	Long. dif.	Long. dif.	Long. dif.
19 10	22 57 16	37 03 25	77 09 52
20 11	23 13 15	37 28 25	78 01 52
21 11	23 28 16	37 53 25	78 53 52
22 10	23 44 16	38 18 25	79 43 52
22 11	24 00 16	38 43 25	80 37 52
23 10	24 16 15	39 08 25	81 30 52
23 11	24 31 16	39 33 25	82 22 52
24 11	24 47 16	39 58 26	83 14 53
25 10	25 03 15	40 24 25	84 07 52
25 11	25 18 15	40 48 25	84 59 53
26 11	25 33 16	41 14 25	85 52 53
27 10	25 49 15	41 39 25	86 45 52
27 11	26 04 16	42 04 25	87 37 52
28 11	26 20 16	42 29 26	88 29 53
29 10	26 36 15	42 55 25	89 22 53
29 11	26 51 16	43 20 25	90 15 53
30 11	27 07 16	43 45 26	91 08 53
31 10	27 23 16	44 11 25	92 01 53
31 11	27 39 16	44 36 25	92 54 53
32 11	27 55 16	45 01 26	93 47 53
33 10	28 11 15	45 27 25	94 40 53
33 11	28 26 16	45 52 26	95 33 53
34 11	28 42 16	46 14 26	96 29 53
35 10	28 58 16	46 44 25	97 19 53
35 11	29 14 16	47 09 26	98 12 53
36 11	29 30 16	47 35 26	99 05 54
37 10	29 46 15	48 01 25	99 59 53
37 11	30 01 16	48 26 25	100 52 53
38 11	30 17 16	48 51 26	101 45 53
39 10	30 33 16	49 17 26	102 38 54

The Second Table of Rumb. b. b. 01

Laut.	First	Second	Third	Fourth					
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.	
30 10 4	06 3	08	32 4	13	45 7	20	35 11		
20 4	09 2	08	36 5	13	52 8	20	46 11		
30 4	11 2	08	41 5	14	00 7	20	57 10		
40 4	13 2	08	46 4	14	07 7	21	07 11		
50 4	15 2	08	50 4	14	14 7	21	18 11		
21 00 4	17 2	08	54 4	14	21 7	21	29 10		
	10 4	19 2	08	58 5	14	28 8	21	39 11	
20 4	21 2	09	03 5	14	36 7	21	50 11		
30 4	23 2	09	08 4	14	43 7	22	01 11		
40 4	25 2	09	12 4	14	50 7	23	32 11		
50 4	27 2	09	16 4	14	57 7	23	23 11		
22 00 4	29 2	09	20 5	15	04 7	22	34 10		
	10 4	31 2	09	25 5	15	11 7	22	44 11	
20 4	33 2	09	30 4	15	18 8	22	55 11		
30 4	35 2	09	34 4	15	26 7	23	06 10		
40 4	37 3	09	38 5	15	33 5	23	16 11		
50 4	40 2	09	43 4	15	41 7	23	27 11		
23 00 4	42 2	09	47 5	15	47 7	23	38 11		
	10 4	44 2	09	52 5	15	55 8	23	49 11	
20 4	46 2	09	57 5	16	03 7	24	00 11		
30 4	48 3	10	02 4	16	10 7	24	11 11		
40 4	51 2	10	06 4	16	17 8	24	22 11		
50 4	53 2	10	10 4	16	25 7	24	33 11		
24 00 4	55 2	10	14 5	16	32 7	24	44 11		
	10 4	57 2	10	19 5	16	39 7	24	55 11	
20 4	59 3	10	24 5	16	46 7	25	06 11		
30 5	05 2	10	29 4	16	53 8	25	17 11		
40 5	04 2	10	33 4	17	01 7	25	28 11		
50 5	06 2	10	37 5	17	08 8	25	39 11		
25 00 5	08 2	10	42 5	17	16 7	25	05 11		

to find the difference of Longitudes

Latit.	Fift	Sixt	Seventh.			
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.
30	10 30 49 16	49 43 26	103 32 54			
31	20 31 05 16	50 09 26	104 26 54			
30	30 31 21 16	50 35 26	105 20 53			
31	40 31 37 16	51 00 26	106 13 54			
32	50 31 53 16	51 29 26	107 07 54			
31	00 32 09 16	51 52 26	108 01 54			
32	10 32 25 16	52 18 26	108 55 54			
31	20 32 41 16	52 44 26	109 49 55			
32	30 32 57 16	53 10 26	110 43 54			
31	40 33 13 16	53 36 26	111 37 53			
32	50 33 29 17	54 02 26	112 31 55			
31	00 33 46 16	54 28 26	113 25 54			
32	10 34 02 16	54 54 26	114 19 54			
31	20 34 18 16	55 20 26	115 13 55			
32	30 34 34 16	55 46 26	116 08 54			
31	40 34 50 16	56 12 26	117 02 55			
32	50 35 06 17	56 38 27	117 57 55			
31	00 35 23 16	57 05 26	118 52 54			
32	10 35 39 16	57 31 26	119 46 55			
31	20 35 55 17	57 57 26	120 41 55			
32	30 36 12 16	58 24 26	121 36 55			
31	40 36 28 16	58 50 26	122 31 55			
32	50 36 44 17	59 16 27	123 26 55			
31	00 37 01 16	59 43 26	124 21 55			
32	10 37 17 16	60 09 26	125 16 55			
31	20 37 33 17	60 35 27	126 11 55			
32	30 37 50 16	61 02 26	127 06 55			
31	40 38 06 17	61 28 27	128 01 55			
32	50 38 23 17	61 55 27	128 56 56			
31	00 38 40 16	62 22 26	129 52 55			

The second Table of Rums.

Latit.	First	Second	Third	Fourth
gr. m.	Long. dif.	Long. dif.	Long. dif.	Long. dif.
25 10 5	10 2	10 47 4	17 23 7	26 01 11
20 5	12 2	10 51 5	17 30 8	26 12 11
30 5	14 3	10 56 5	17 38 7	26 23 11
40 5	17 2	11 01 4	17 45 9	26 34 11
50 5	19 2	11 05 5	17 52 8	26 45 11
26 00 5	21 2	11 10 4	18 00 7	26 56 11
10 5	23 2	11 14 4	18 07 8	27 07 11
20 5	25 2	11 18 5	18 15 8	27 18 11
30 5	27 3	11 23 5	18 23 7	27 29 11
40 5	30 2	11 28 5	18 30 7	27 40 11
50 5	32 2	11 33 4	18 37 8	27 51 11
27 00 5	34 2	11 37 5	18 45 7	28 03 11
10 5	36 3	11 42 5	18 52 7	28 14 11
20 5	39 2	11 47 4	18 59 8	28 25 12
30 5	42 2	11 51 5	19 07 8	28 37 11
40 5	43 3	11 56 5	19 15 7	28 48 11
50 5	46 2	12 01 4	19 22 8	28 59 12
28 00 5	48 2	12 05 5	19 30 7	29 11 11
10 5	50 2	12 10 5	19 37 8	29 22 11
20 5	52 3	12 15 5	19 45 8	29 33 12
30 5	55 2	12 20 4	19 53 7	29 45 11
40 5	57 3	12 24 5	20 00 8	29 56 11
50 6	00 2	12 29 4	20 08 8	30 07 12
29 00 6	02 2	12 33 5	20 16 7	30 19 11
10 6	04 3	12 38 5	20 23 8	30 30 12
20 6	07 2	12 43 5	20 31 8	30 42 12
30 6	09 2	12 48 5	20 39 7	30 54 11
40 6	11 2	12 53 4	20 46 8	31 05 11
50 6	13 3	12 57 5	20 54 8	31 16 12
30 00 6	16 2	12 02 5	20 02 7	31 28 11

to find the difference of Longitudes.

Latit.	First	Sixt	Seventh
Cr. m.	Long. dif.	Long. dif.	Long. dif.
40 10 38	39 16	62 48	27 130 47 56
20 39	12 17	63 15	27 131 43 56
30 39	29 16	63 42	26 132 39 56
40 39	45 17	64 08	27 133 34 56
50 40	02 17	64 35	27 134 30 56
41 00 40	19 16	65 02	27 135 26 56
10 40	35 17	65 29	27 136 32 56
20 40	52 17	65 59	27 137 18 56
30 41	09 17	66 23	27 138 14 56
40 41	26 17	66 50	27 139 10 56
50 41	43 17	67 17	27 140 06 57
42 00 42	00 16	67 44	27 141 03 56
10 42	16 17	68 11	27 141 59 57
20 42	33 17	68 38	28 142 56 57
30 42	50 16	69 06	27 143 53 56
40 43	06 17	69 33	27 144 19 57
50 43	23 17	70 00	28 145 46 57
43 00 43	40 17	70 28	27 146 43 57
10 43	57 17	70 56	27 147 40 57
20 44	14 18	71 22	28 148 37 57
30 44	32 17	71 50	27 149 34 57
40 44	49 17	72 17	27 150 31 57
50 45	06 17	72 44	28 151 28 58
4 00 45	23 17	73 12	27 152 26 58
10 45	40 17	73 39	28 153 24 58
20 45	57 17	74 07	28 154 22 58
30 46	14 17	74 35	28 155 20 58
40 46	31 17	75 03	28 156 18 58
50 46	48 18	75 31	28 157 16 58
45 00 47	06 17	75 59	28 158 14 58

The second Table of Rums.

Latit.	First	Second	Third	Fourth
gr. m.	Long. dif.	Long.	Long. dif.	Long. dif.
30 10 6	18 2	13 7 5	25 0 9 8	31 3 9 12
20 6	25 2	13 12 4	25 17 8	31 5 12
30 6	22 3	13 16 5	25 25 7	32 0 3 11
40 6	25 2	13 21 5	25 32 8	32 1 4 12
50 6	27 2	13 26 5	25 40 8	32 2 6 12
31 00 6	29 3	13 31 5	25 49 8	32 3 8 11
10 6	32 2	13 36 5	25 56 8	32 4 9 12
20 6	34 3	13 41 5	26 0 4 8	33 0 1 12
30 6	37 2	13 46 5	26 12 7	33 1 3 11
40 6	39 2	13 51 5	26 19 8	33 2 4 12
50 6	41 2	13 56 4	26 27 8	33 3 6 12
32 00 6	43 3	14 00 5	26 35 8	33 4 8 12
10 6	46 2	14 05 5	26 43 8	34 0 0 12
20 6	48 3	14 10 5	26 51 8	34 1 2 12
30 6	51 2	14 15 5	26 59 8	34 2 4 11
40 6	53 2	14 20 4	27 0 7 8	34 3 5 12
50 6	55 3	14 24 5	27 15 8	34 4 7 12
33 00 6	58 2	14 29 5	27 23 8	34 5 9 12
10 7	00 3	14 34 5	27 31 8	35 1 1 12
20 7	03 2	14 39 6	27 39 8	35 2 3 12
30 7	05 3	14 45 5	27 47 8	35 3 5 12
40 7	08 2	14 50 5	27 55 8	35 4 7 12
50 7	10 2	14 55 5	28 03 8	35 5 9 12
34 00 7	12 2	15 00 5	28 11 8	36 1 1 12
10 7	14 3	15 05 4	28 19 8	36 2 3 12
20 7	17 3	15 09 5	28 27 8	36 3 5 13
30 7	20 2	15 14 5	28 35 8	36 4 8 12
40 7	22 2	15 19 5	28 43 8	37 0 0 12
50 7	24 2	15 24 6	28 51 9	37 1 1 12
35 00 7	26 3	15 30 5	28 00 8	37 2 4 12

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh	8th	9th	10th
30 10 47	23 17	76 27 18	159 32 58	700 32	100 32	100 32
20 47	40 18	76 55 28	160 10 58	700 32	100 32	100 32
30 47	58 17	77 23 28	161 08 58	700 32	100 32	100 32
40 48	15 17	77 51 28	162 06 59	700 32	100 32	100 32
50 48	32 18	78 19 28	163 05 59	700 32	100 32	100 32
31 00 48	50 17	78 47 28	164 04 58	700 32	100 32	100 32
10 49	07 18	79 15 28	165 02 59	700 32	100 32	100 32
20 49	25 18	79 43 29	166 01 59	700 32	100 32	100 32
30 49	43 17	80 11 28	167 00 59	700 32	100 32	100 32
40 50	00 18	80 40 28	167 59 59	700 32	100 32	100 32
50 50	18 18	81 08 29	168 58 50	700 32	100 32	100 32
32 00 50	36 17	81 37 28	169 58 59	700 32	100 32	100 32
10 50	53 17	82 05 28	170 57 59	700 32	100 32	100 32
20 51	10 18	82 33 29	171 56 59	700 32	100 32	100 32
30 51	28 18	83 02 29	172 55 60	700 32	100 32	100 32
40 51	46 18	83 31 29	173 55 60	700 32	100 32	100 32
50 52	04 18	84 00 29	174 55 60	700 32	100 32	100 32
33 00 52	22 18	84 29 28	175 55 60	700 32	100 32	100 32
10 52	40 18	84 57 29	176 55 60	700 32	100 32	100 32
20 52	58 18	85 26 29	177 55 60	700 32	100 32	100 32
30 53	16 18	85 55 29	178 55 60	700 32	100 32	100 32
40 53	34 18	86 24 29	179 55 61	700 32	100 32	100 32
50 53	52 18	86 53 29	180 56 61	700 32	100 32	100 32
34 00 54	10 18	87 22 29	181 57 60	700 32	100 32	100 32
10 54	28 18	87 51 29	182 57 61	700 32	100 32	100 32
20 54	46 18	88 20 30	183 58 61	700 32	100 32	100 32
30 55	04 18	88 50 29	184 59 61	700 32	100 32	100 32
40 55	22 18	89 19 29	186 00 61	700 32	100 32	100 32
50 55	40 19	89 48 30	187 01 61	700 32	100 32	100 32
35 00 55	59 18	90 18 21	188 02 61	700 32	100 32	100 32

The second Table of Rumb.

Latit.	First	Second	Third	Fourth					
gr.	m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
35	10 7	29 3	15 35 5	25 08 8	37 36 12				
	20 7	31 3	15 40 5	25 14 8	37 48 13				
	30 7	34 3	15 45 5	25 24 8	38 01 12				
	40 7	36 3	15 50 5	25 32 8	38 53 12				
	50 7	39 3	15 55 5	25 40 9	38 25 13				
	00 7	41 2	16 00 5	25 49 8	38 38 12				
36	10 7	43 3	16 05 6	25 57 8	38 50 12				
	20 7	46 2	16 11 5	26 06 9	39 02 13				
	30 7	48 3	16 16 5	26 14 8	39 15 12				
	40 7	51 2	16 21 5	26 22 8	39 27 12				
	50 7	53 2	16 26 5	26 30 8	39 36 13				
	00 7	55 3	16 31 5	26 38 8	39 52 12				
37	10 7	58 3	16 36 5	26 46 9	40 04 13				
	20 8	01 2	16 41 6	26 55 9	40 17 13				
	30 8	03 3	16 47 5	27 04 8	40 30 12				
	40 8	06 2	16 52 5	27 12 8	40 42 13				
	50 8	08 3	16 57 5	27 20 9	40 55 13				
	00 8	11 3	17 02 5	27 29 8	41 08 12				
38	10 8	1 2	17 07 5	27 37 9	41 20 13				
	20 8	16 3	17 12 6	27 46 9	41 33 13				
	30 8	19 2	17 18 6	27 55 8	41 46 13				
	40 8	21 3	17 24 5	28 03 8	41 59 13				
	50 8	24 2	17 29 5	28 11 9	42 12 13				
	00 8	26 3	17 34 5	28 20 8	42 25 13				
39	10 8	29 2	17 39 5	28 28 9	42 12 13				
	20 8	31 3	17 44 5	28 37 9	42 13 13				
	30 8	34 3	17 49 6	28 46 9	43 12 13				
	40 8	37 2	17 55 6	28 55 9	43 12 13				
	50 8	39 3	18 01 5	28 04 9	43 13 13				
	00 8	42 2	18 06 6	28 13 8	43 12 13				

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh			
yr. m.	Longit.	dif.	Longit.	dif.	Longit.	dif.
35 10 56	37 18	90	47 30	189 03	63	
35 20 56	35 19	91	47 30	190 05	62	
35 30 56	34 18	91	47 29	191 07	62	
35 40 57	32 18	92	46 30	192 09	62	
35 50 57	30 19	92	46 30	193 11	62	
36 00 57	49 18	93	46 30	194 13	62	
36 10 58	07 19	93	46 30	195 15	62	
36 20 58	26 19	94	46 30	196 17	63	
36 30 58	45 18	94	46 30	197 20	62	
36 40 59	03 19	95	46 30	198 23	63	
36 50 59	22 19	95	46 30	199 25	63	
37 00 59	41 18	96	46 30	200 28	63	
37 10 59	59 19	96	46 30	201 31	63	
37 20 60	18 19	97	46 30	202 34	63	
37 30 60	37 19	97	47 31	203 37	64	
37 40 60	56 19	98	47 30	204 41	64	
37 50 61	15 19	98	48 31	205 45	64	
38 00 61	34 19	99	49 30	206 49	63	
38 10 61	53 19	99	49 31	207 52	64	
38 20 62	12 19	100	50 31	208 56	64	
38 30 62	31 19	100	51 31	210 00	64	
38 40 62	50 19	101	52 31	211 04	65	
38 50 63	09 20	101	53 31	212 09	65	
39 00 63	29 19	102	54 31	213 14	64	
39 10 63	48 19	102	55 31	214 18	65	
39 20 64	07 20	103	56 31	215 23	65	
39 30 64	27 19	103	57 31	216 28	65	
39 40 64	46 19	104	58 31	217 33	66	
39 50 65	05 20	104	59 32	218 39	66	
40 00 65	25 19	105	31 31	219 45	65	

The second Table of Rums.

Latit.	First	Second	Third	Fourth				
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
40 10 8	44 1	18 12 6	29 21 9	43 36 13				
20 8	47 2	14 18 5	29 30 9	44 06 13				
30 8	49 3	18 23 5	29 39 8	44 22 13				
40 8	52 2	18 28 6	29 47 9	44 39 13				
50 8	54 3	18 34 5	29 56 9	44 48 14				
41 00 8	57 3	18 39 5	30 05 9	45 02 13				
10 9	00 3	18 44 6	30 14 9	45 15 13				
20 9	03 3	18 05 6	30 63 9	45 28 13				
30 9	06 2	18 56 5	30 32 9	45 41 13				
40 9	08 3	19 01 5	30 41 9	45 54 14				
50 9	11 2	19 06 6	30 50 9	46 08 14				
42 00 9	13 3	19 12 6	30 59 9	46 22 13				
10 9	16 2	19 18 5	31 08 9	46 35 13				
20 9	18 3	19 13 6	31 17 9	46 48 14				
30 9	21 3	19 29 6	31 26 9	47 02 13				
40 9	24 3	19 35 5	31 35 9	47 15 14				
50 9	27 2	19 40 6	31 44 9	47 29 14				
43 00 9	30 3	19 46 6	31 53 9	47 43 13				
10 9	32 3	19 52 5	32 02 9	47 56 14				
20 9	35 2	19 57 6	32 11 9	48 10 14				
30 9	33 3	20 03 6	32 20 9	48 24 14				
40 9	40 3	20 09 6	32 29 9	48 38 14				
50 9	43 3	20 15 5	32 38 10	48 52 14				
44 00 9	46 2	20 20 6	32 48 9	49 06 14				
10 9	48 3	20 26 6	32 57 9	49 20 14				
20 9	51 3	20 32 6	33 06 10	49 34 14				
30 9	54 3	20 38 6	33 16 9	49 48 14				
40 9	57 3	20 44 6	33 25 9	50 02 14				
50 10 0	00 3	20 50 5	33 34 10	50 16 14				
45 00 10	03 3	20 55 6	33 44 9	50 30 14				

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh			
gr.m.	Longit.	dif.	Longit.	dif.	Longit.	dif.
40 10 65	44 20		106 02 32	220 50 66		
	20 66	08 20	106 34 32	221 56 66		
	30 66	24 19	107 06 32	223 02 66		
	40 66	44 20	107 38 32	224 08 67		
	50 67	03 20	108 10 32	225 15 67		
41 00 67	23 20		108 42 32	226 22 66		
	10 67	43 20	109 14 32	227 28 67		
	20 68	03 20	109 46 32	228 35 67		
	30 68	23 20	110 18 32	229 42 67		
	40 68	43 20	110 50 32	230 49 67		
	50 69	03 20	111 22 33	231 56 68		
42 00 69	23 20		111 55 32	232 04 68		
	10 69	43 20	112 27 33	234 12 68		
	20 70	03 20	113 00 32	235 20 68		
	30 70	23 20	113 33 33	236 28 68		
	40 70	43 21	114 05 33	237 36 68		
	50 71	04 21	114 38 33	238 44 69		
43 00 71	25 20		115 11 33	239 53 69		
	10 71	45 20	115 44 33	241 02 69		
	20 72	05 21	116 17 34	242 11 69		
	30 72	26 20	116 51 33	243 20 69		
	40 72	46 21	117 24 33	244 29 70		
	50 73	07 21	117 57 34	245 39 70		
44 00 73	28 21		118 31 34	246 49 70		
	10 73	49 21	119 05 34	247 59 70		
	20 74	10 21	119 39 34	249 09 70		
	30 74	31 20	120 13 34	250 19 71		
	40 74	51 21	120 47 34	251 30 71		
	50 75	12 22	121 21 34	252 41 71		
45 00 75	34 21		121 55 34	253 52 71		

The second Table of Rums.

Zatit.	First	Second	Third	Fourth					
gr.	m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
45	10 10	06 2	21 01 6	33 53 10	50 44 14				
	20 10	08 3	21 07 6	34 03 10	50 58 14				
	30 10	11 3	21 13 6	34 13 09	51 12 14				
	40 10	14 3	21 19 5	34 22 09	51 26 15				
	50 10	17 3	21 24 6	34 31 10	51 41 15				
46	00 19	20 2	21 20 6	34 41 10	51 56 14				
	10 10	22 3	21 36 6	34 51 10	52 10 14				
	20 10	25 3	21 42 6	35 01 10	52 24 15				
	30 10	28 3	21 48 6	35 11 09	52 39 14				
	40 10	31 3	21 54 6	35 20 10	52 53 14				
	50 10	34 3	22 00 7	35 30 10	53 07 15				
47	00 10	37 3	22 07 6	35 40 09	53 22 15				
	10 10	40 3	22 13 6	35 49 10	53 37 15				
	20 10	43 2	22 19 6	35 59 10	53 52 15				
	30 10	45 3	22 25 6	36 09 10	54 07 14				
	40 10	48 3	22 31 6	36 19 10	54 21 15				
	50 10	51 4	22 37 6	36 29 10	54 36 15				
48	00 10	55 3	22 43 6	36 39 10	54 51 15				
	10 10	58 3	22 49 7	36 49 10	55 06 15				
	20 11	01 3	22 56 6	36 59 10	55 21 15				
	30 11	04 3	23 02 6	37 09 10	55 36 15				
	40 11	07 3	23 08 7	37 19 10	55 51 15				
	50 11	10 3	23 15 6	37 29 11	56 06 16				
49	00 11	13 3	23 21 6	37 40 10	56 22 15				
	10 11	16 3	23 27 6	37 50 10	56 37 15				
	20 11	19 3	23 33 6	38 00 10	56 52 16				
	30 11	22 3	23 39 6	38 10 10	57 08 15				
	40 11	25 3	23 45 7	38 20 10	57 33 15				
	50 11	28 3	23 52 7	38 30 11	57 38 16				
50	00 11	31 3	23 59 6	38 41 10	57 45 15				

to find the difference of Longitudes.

	Latitude	Fifth	Sixth	Seventh		
	Long.	Long. dif.	Long.	Long. dif.	Long.	Long. dif.
45	10 75	55 21	123 39	34	255 03 71	
44	20 76	36 22	123 03	34	256 14 73	
43	30 76	38 21	123 37	34	257 26 73	
42	40 76	59 22	124 11	35	258 38 73	
41	50 77	21 22	124 46	35	259 50 73	
40	46 00	77 43 21	125 21	35	261 02 73	
39	19 78	04 21	125 56	35	262 14 73	
38	20 78	39 22	126 31	35	263 27 73	
37	30 78	47 22	127 06	35	264 40 73	
36	40 79	09 22	127 41	35	265 53 73	
35	50 79	31 22	128 16	36	267 06 74	
34	47 00	79 53 22	128 52	35	268 20 74	
33	10 80	15 22	129 27	35	269 34 74	
32	20 80	37 22	130 02	36	270 48 75	
31	30 80	59 22	130 38	36	272 03 74	
30	40 81	21 22	131 14	36	273 17 73	
29	50 81	43 22	131 50	36	274 32 73	
28	48 00	82 05 22	132 26	36	275 47 73	
27	10 82	27 23	133 02	36	277 02 73	
26	20 82	50 23	133 38	37	278 17 76	
25	30 83	13 22	134 15	36	279 33 76	
24	40 83	35 23	134 51	37	280 49 77	
23	50 83	58 23	135 28	37	282 06 77	
22	49 00	84 21 23	136 05	36	283 23 76	
21	10 84	44 23	136 41	37	284 39 77	
20	20 85	07 23	137 18	37	285 56 77	
19	30 85	30 23	137 55	37	287 13 78	
18	40 85	53 23	138 32	38	288 31 78	
17	50 86	16 24	139 10	38	289 49 78	
16	50 00	86 40 23	139 48	37	291 07 78	

The second Table of Rumb.

Latit. | First | Second | Third | Fourth

gr. m.	Long.	dis.	Long.	dis.	Long.	dis.	Long.	dis.
50	10 11	34 3	24 06	7	38 51	11 58	29 09	16
	20 11	37 3	24 12	7	39 02	11 58	29 16	
	30 11	40 4	24 19	7	39 33	10 58	29 41	16
	40 11	44 3	24 26	6	39 23	10 58	29 56	15
	50 11	47 3	24 32	6	39 33	11 59	29 12	16
	51 00	50 3	24 38	7	39 44	10 59	28 16	
51	10 11	53 3	24 45	6	39 54	11 59	28 44	16
	20 11	56 4	24 53	7	40 05	11 60	28 00	16
	30 12	00 3	24 58	7	40 16	11 60	28 16	
	40 12	03 3	25 05	7	40 27	11 60	28 32	16
	50 12	06 3	25 12	6	40 38	11 60	28 48	17
	51 00	09 3	25 18	7	40 49	11 61	28 05	16
52	10 12	12 3	25 25	7	41 00	11 61	28 31	16
	20 12	15 4	25 32	7	41 11	11 61	28 37	17
	30 12	19 3	25 39	6	41 22	11 61	28 54	16
	40 12	22 3	25 45	7	41 33	11 62	29 10	17
	50 12	25 3	25 52	7	41 44	11 62	29 27	17
	52 00	28 4	25 59	7	41 55	11 62	28 44	16
53	10 12	32 4	26 06	7	42 06	11 63	29 00	17
	20 12	36 3	26 13	7	42 17	11 63	28 17	17
	30 12	39 3	26 20	7	42 28	11 63	28 34	16
	40 12	42 3	26 27	7	42 39	11 63	28 50	17
	50 12	45 4	26 34	7	42 50	12 64	28 07	17
	53 00	49 3	26 40	7	43 02	11 64	28 24	17
54	10 12	52 4	26 48	7	43 41	11 64	28 41	17
	20 12	56 3	26 55	7	43 52	12 64	28 58	18
	30 12	59 3	27 02	7	43 56	11 65	28 46	17
	40 13	02 4	27 09	7	43 47	12 65	28 33	17
	50 13	06 4	27 16	7	43 59	12 65	28 50	18
	55 00	10 2	27 23	7	43 11	11 66	28 08	17

101 To find the difference of Longitudes.

Lat.	Fifth	Sixth	Seventh	Eighth
deg.	min.	Long.	Long.	min.
16	10 87	03 23	140 25	38 22 01 22
16	20 87	26 24	141 03	38 22 02
16	30 87	39 23	141 41	38 22 03
15	40 88	53 24	142 19	38 22 04
16	50 88	37 24	142 57	38 22 05
16	100 89	01 23	143 35	38 22 06
16	10 89	24 24	144 13	39 01 01
16	20 89	48 24	144 52	39 01 02
16	30 90	13 24	145 31	39 01 03
16	40 90	36 24	146 10	39 01 04
17	50 91	00 25	146 49	39 01 05
16	100 91	25 24	147 28	39 01 06
16	10 91	49 24	148 07	39 01 07
17	20 92	13 25	148 46	40 01 02
16	30 92	38 24	149 26	40 01 03
17	40 93	02 25	150 06	40 01 04
17	50 93	27 25	150 46	40 01 05
16	100 93	52 25	151 26	40 01 06
17	10 94	17 25	152 06	40 01 07
17	20 94	42 25	152 46	41 01 03
16	30 95	08 25	153 27	40 01 08
17	40 95	33 25	154 07	41 01 09
17	50 96	58 25	154 48	41 01 10
17	100 96	22 25	155 29	41 01 11
17	10 96	48 26	156 10	41 01 12
18	20 97	14 26	156 51	42 01 02
17	30 97	40 26	157 33	42 01 03
17	40 98	06 26	158 15	42 01 04
18	50 98	32 26	158 57	42 01 05
17	100 98	58 26	159 39	42 01 06

The Second Table of Results.

Latit.	First	Second	Third	Fourth	Lat.
gr.	m.	Long.	dif.	Long.	Long.
55	10 13	13 35	27 22 30 8	44 0 33 12	66 33 17
	20 13	16 4	27 22 38 7	44 1 34 12	66 42 18
	30 13	20 3	27 22 45 7	44 2 46 12	67 50 18
	40 13	23 4	27 22 52 8	44 3 58 12	67 58 18
	50 13	27 3	28 00 7	45 4 10 12	67 36 18
56 00	13 20 3	28 00 7	45 5 22 12	67 34 18	56
	10 13	33 4	28 15 8	45 6 34 12	68 18 18
	20 13	37 4	28 23 7	45 7 46 12	68 30 18
	30 13	41 3	28 30 7	45 8 58 12	68 48 18
	40 13	44 4	28 37 8	46 0 10 12	69 56 18
	50 13	48 4	28 45 7	46 1 22 12	69 24 18
57 00	13 53 4	28 52 8	46 2 35 12	69 42 18	57
	10 13	56 8	29 00 8	46 3 47 12	70 00 19
	20 14	00 3	29 08 7	46 4 59 13	70 19 19
	30 14	03 4	29 15 8	47 1 12 12	70 38 18
	40 14	07 4	29 23 8	47 2 34 12	70 56 19
	50 14	11 3	29 33 7	47 3 46 13	71 15 19
58 00	14 14 40	29 38 8	47 7 14 12	71 34 19	58
	10 14	18 4	29 46 8	48 0 0 13	71 53 19
	20 14	22 4	29 54 8	48 1 14 13	72 12 19
	30 14	26 3	30 02 8	48 2 27 13	72 31 19
	40 14	29 4	30 10 8	48 3 40 13	72 50 19
	50 14	33 4	30 18 8	48 4 53 13	73 09 19
59 00	14 37 4	30 26 9	48 5 06 12	73 39 19	59
	10 14	41 3	30 35 8	49 1 39 13	73 49 19
	20 14	45 4	30 43 8	49 2 32 13	74 07 20
	30 14	48 4	30 51 8	49 3 45 13	74 37 20
	40 14	52 4	30 59 8	49 4 58 13	74 57 20
	50 14	56 4	31 07 8	50 1 31 14	74 07 20
60 00	15 00 4	31 15 8	50 2 25 13	75 27 20	60

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh	8th	9th	10th	11th
Mr. M.	Long.	dif.	Long.	dif.	Long.	dif.	12th
17 55	10 99 24 26	160 21 43	333 55 88	21 02 03			
18 20	99 30 27	161 03 43	335 23 89	21 02			
18 30	100 17 26	161 46 43	336 52 89	21 02			
18 40	100 43 27	162 29 43	338 21 89	21 02			
18 50	101 10 27	163 12 43	339 50 89	21 02			
18 56 00	101 37 27	163 55 43	341 19 90	21 02 12			
19 10	102 04 27	164 38 43	342 49 91	21 02			
19 20	102 31 27	165 21 44	344 20 91	21 02			
19 30	102 58 27	166 05 44	345 51 91	21 02			
19 40	103 25 27	166 49 44	347 32 93	21 04			
19 50	103 52 27	167 33 45	348 54 92	21 02			
19 57 00	104 19 27	168 18 44	350 26 93	21 00 48			
19 59	104 46 28	169 02 44	351 59 93	21 02			
19 59	105 14 28	169 46 45	353 32 93	21 02			
19 59	105 42 28	170 31 45	355 05 94	21 02			
19 59	105 10 28	171 16 45	356 39 94	21 04			
19 59	106 38 29	172 01 46	358 13 94	21 02			
19 58 00	107 07 28	172 47 45	359 47 95	21 00 28			
19 59	107 35 28	173 32 46	361 23 96	21 02			
19 59	108 03 29	174 18 46	362 58 96	21 02			
19 59	108 32 28	175 04 46	364 34 97	21 02			
19 59	109 00 29	175 50 47	366 18 97	21 04			
19 59	109 39 29	176 37 47	367 48 97	21 02			
19 59 00	109 58 29	177 24 47	369 25 98	21 00 48			
19 59	110 27 29	178 11 47	371 03 98	21 02			
19 59	110 56 30	178 58 48	373 41 99	21 02			
19 59	111 26 29	179 46 48	374 20 99	21 02			
19 59	111 55 30	180 34 48	375 59 100	21 02			
19 59	112 23 30	181 22 48	377 39 100	21 02			
19 59 00	112 55 30	182 10 48	379 10 101	21 00 23			

The second Table of Rumbt.

Latit.	Fifte	Second	Third	Fourt				
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
60 10	15 04 42	32 24 8	50 38 13	79 47 2				
	20 15 08 42	32 29	50 51 14	75 07 2				
	30 15 12 42	32 41 8	50 55 14	76 37 2				
	40 15 16 42	32 49 8	51 39 13	76 47 2				
	50 15 20 52	32 57 8	51 33 14	77 08 2				
61 00	15 25 42	32 05 9	51 47 13	77 29 2				
	10 15 29 42	32 14 9	52 00 14	77 49 2				
	20 15 33 42	32 23 9	52 14 14	78 10 2				
	30 15 37 42	32 32 9	52 28 14	78 31 2				
	40 15 41 52	32 41 8	52 42 14	78 53 2				
	50 15 45 42	32 49 9	52 56 15	79 13 2				
62 00	15 50 42	32 58 9	53 11 14	79 34 2				
	10 15 54 42	33 07 9	53 25 14	79 55 2				
	20 15 58 42	33 16 9	53 39 14	80 17 2				
	30 16 02 42	33 25 9	53 53 15	80 39 2				
	40 16 06 52	33 34 9	54 08 15	81 01 2				
	50 16 12 42	33 43 9	54 23 35	81 23 2				
63 00	16 16 42	33 52 9	54 38 14	81 45 2				
	10 16 20 52	34 01 9	54 52 15	82 07 2				
	20 16 25 42	34 10 9	55 07 15	82 29 2				
	30 16 29 52	34 19 9	55 22 15	82 51 2				
	40 16 34 42	34 28 10	55 37 15	83 13 2				
	50 16 38 52	34 38 9	55 52 15	83 36 2				
64 00	16 43 42	34 47 10	56 07 15	83 59 2				
	10 16 47 52	34 57 10	56 22 15	84 22 2				
	20 16 52 42	35 07 9	56 37 16	84 45 2				
	30 16 56 52	35 16 10	56 52 16	85 08 2				
	40 17 01 42	35 26 10	57 09 16	85 31 2				
	50 17 05 52	35 36 9	57 25 16	85 54 2				
65 00	17 10 52	35 45 10	57 41 15	86 18 2				

to find the difference of Longitudes.

Latit.	First	Second	Third	Fourth
0° 00'	00 00 00 00	00 00 00 00	00 00 00 00	00 00 00 00
1° 00'	10 11 12 13	10 11 12 13	10 11 12 13	10 11 12 13
2° 00'	20 21 22 23	20 21 22 23	20 21 22 23	20 21 22 23
3° 00'	30 31 32 33	30 31 32 33	30 31 32 33	30 31 32 33
4° 00'	40 41 42 43	40 41 42 43	40 41 42 43	40 41 42 43
5° 00'	50 51 52 53	50 51 52 53	50 51 52 53	50 51 52 53
6° 00'	60 61 62 63	60 61 62 63	60 61 62 63	60 61 62 63
7° 00'	70 71 72 73	70 71 72 73	70 71 72 73	70 71 72 73
8° 00'	80 81 82 83	80 81 82 83	80 81 82 83	80 81 82 83
9° 00'	90 91 92 93	90 91 92 93	90 91 92 93	90 91 92 93
10° 00'	100 101 102 103	100 101 102 103	100 101 102 103	100 101 102 103
11° 00'	110 111 112 113	110 111 112 113	110 111 112 113	110 111 112 113
12° 00'	120 121 122 123	120 121 122 123	120 121 122 123	120 121 122 123
13° 00'	130 131 132 133	130 131 132 133	130 131 132 133	130 131 132 133
14° 00'	140 141 142 143	140 141 142 143	140 141 142 143	140 141 142 143
15° 00'	150 151 152 153	150 151 152 153	150 151 152 153	150 151 152 153
16° 00'	160 161 162 163	160 161 162 163	160 161 162 163	160 161 162 163
17° 00'	170 171 172 173	170 171 172 173	170 171 172 173	170 171 172 173
18° 00'	180 181 182 183	180 181 182 183	180 181 182 183	180 181 182 183
19° 00'	190 191 192 193	190 191 192 193	190 191 192 193	190 191 192 193
20° 00'	200 201 202 203	200 201 202 203	200 201 202 203	200 201 202 203
21° 00'	210 211 212 213	210 211 212 213	210 211 212 213	210 211 212 213
22° 00'	220 221 222 223	220 221 222 223	220 221 222 223	220 221 222 223
23° 00'	230 231 232 233	230 231 232 233	230 231 232 233	230 231 232 233
24° 00'	240 241 242 243	240 241 242 243	240 241 242 243	240 241 242 243
25° 00'	250 251 252 253	250 251 252 253	250 251 252 253	250 251 252 253
26° 00'	260 261 262 263	260 261 262 263	260 261 262 263	260 261 262 263
27° 00'	270 271 272 273	270 271 272 273	270 271 272 273	270 271 272 273
28° 00'	280 281 282 283	280 281 282 283	280 281 282 283	280 281 282 283
29° 00'	290 291 292 293	290 291 292 293	290 291 292 293	290 291 292 293
30° 00'	300 301 302 303	300 301 302 303	300 301 302 303	300 301 302 303
31° 00'	310 311 312 313	310 311 312 313	310 311 312 313	310 311 312 313
32° 00'	320 321 322 323	320 321 322 323	320 321 322 323	320 321 322 323
33° 00'	330 331 332 333	330 331 332 333	330 331 332 333	330 331 332 333
34° 00'	340 341 342 343	340 341 342 343	340 341 342 343	340 341 342 343
35° 00'	350 351 352 353	350 351 352 353	350 351 352 353	350 351 352 353
36° 00'	360 361 362 363	360 361 362 363	360 361 362 363	360 361 362 363
37° 00'	370 371 372 373	370 371 372 373	370 371 372 373	370 371 372 373
38° 00'	380 381 382 383	380 381 382 383	380 381 382 383	380 381 382 383
39° 00'	390 391 392 393	390 391 392 393	390 391 392 393	390 391 392 393
40° 00'	400 401 402 403	400 401 402 403	400 401 402 403	400 401 402 403
41° 00'	410 411 412 413	410 411 412 413	410 411 412 413	410 411 412 413
42° 00'	420 421 422 423	420 421 422 423	420 421 422 423	420 421 422 423
43° 00'	430 431 432 433	430 431 432 433	430 431 432 433	430 431 432 433
44° 00'	440 441 442 443	440 441 442 443	440 441 442 443	440 441 442 443
45° 00'	450 451 452 453	450 451 452 453	450 451 452 453	450 451 452 453
46° 00'	460 461 462 463	460 461 462 463	460 461 462 463	460 461 462 463
47° 00'	470 471 472 473	470 471 472 473	470 471 472 473	470 471 472 473
48° 00'	480 481 482 483	480 481 482 483	480 481 482 483	480 481 482 483
49° 00'	490 491 492 493	490 491 492 493	490 491 492 493	490 491 492 493
50° 00'	500 501 502 503	500 501 502 503	500 501 502 503	500 501 502 503
51° 00'	510 511 512 513	510 511 512 513	510 511 512 513	510 511 512 513
52° 00'	520 521 522 523	520 521 522 523	520 521 522 523	520 521 522 523
53° 00'	530 531 532 533	530 531 532 533	530 531 532 533	530 531 532 533
54° 00'	540 541 542 543	540 541 542 543	540 541 542 543	540 541 542 543
55° 00'	550 551 552 553	550 551 552 553	550 551 552 553	550 551 552 553
56° 00'	560 561 562 563	560 561 562 563	560 561 562 563	560 561 562 563
57° 00'	570 571 572 573	570 571 572 573	570 571 572 573	570 571 572 573
58° 00'	580 581 582 583	580 581 582 583	580 581 582 583	580 581 582 583
59° 00'	590 591 592 593	590 591 592 593	590 591 592 593	590 591 592 593
60° 00'	600 601 602 603	600 601 602 603	600 601 602 603	600 601 602 603
61° 00'	610 611 612 613	610 611 612 613	610 611 612 613	610 611 612 613
62° 00'	620 621 622 623	620 621 622 623	620 621 622 623	620 621 622 623
63° 00'	630 631 632 633	630 631 632 633	630 631 632 633	630 631 632 633
64° 00'	640 641 642 643	640 641 642 643	640 641 642 643	640 641 642 643
65° 00'	650 651 652 653	650 651 652 653	650 651 652 653	650 651 652 653

The second Table of Rumbas.

Latit.	First	Second	Third	Fourth
gr. m.	Long. dif.	Long. dif.	Long. dif.	Long. dif.
65 10	17 15 4	35 55 10	57 56 16	86 43 24
20	17 19 5	36 05 10	58 12 16	87 06 24
30	17 24 5	36 15 10	58 28 16	87 30 24
40	17 29 5	36 25 10	58 44 16	87 54 24
50	17 34 5	36 35 10	59 00 17	88 18 25
66 00	17 39 4	36 45 10	59 17 16	88 43 24
10	17 43 5	36 55 11	59 33 16	89 07 25
20	17 48 5	37 06 10	59 49 17	89 32 25
30	17 53 5	37 16 10	60 06 17	89 57 25
40	17 58 5	37 26 11	60 23 17	90 22 25
50	18 03 5	37 37 11	60 40 18	90 47 26
67 00	18 08 5	37 48 10	60 58 17	91 13 26
10	18 13 6	37 58 11	61 15 17	91 39 26
20	18 19 5	38 09 11	61 32 17	92 05 26
30	18 24 6	38 20 11	61 49 18	92 31 26
40	18 30 5	38 31 11	62 07 18	92 57 26
50	18 35 5	38 42 11	62 25 18	93 23 27
68 00	18 40 5	38 53 11	62 43 17	93 50 27
10	18 45 6	39 04 11	63 00 18	94 17 27
20	18 51 6	39 15 11	63 18 18	94 44 27
30	18 57 5	39 26 12	63 36 18	95 15 27
40	19 03 5	39 38 11	63 54 19	95 38 28
50	19 07 6	39 49 11	64 13 19	96 06 28
69 00	19 13 5	40 00 12	64 32 18	96 34 28
10	19 18 6	40 12 12	64 50 19	97 07 28
20	19 24 5	40 24 11	65 09 19	97 30 28
30	19 29 6	40 35 12	65 28 19	97 58 29
40	19 35 6	40 47 11	65 47 19	98 37 29
50	19 41 6	40 06 12	66 06 20	98 56 29
60 00	19 47 6	41 36 12	66 26 20	99 35 29

to find the difference of Longitudes.

Latit.	Fift	Sixt	Seventh			
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.
65 10	129 45 36		209 19 58	439 53	120	
24	20 130 21 36		210 17 58	437 53	121	
24	30 130 57 36		211 15 58	439 54	122	
24	40 131 33 36		212 13 58	441 56	122	
25	50 132 09 37		213 12 59	443 58	123	
24	66 00 133 46 37		214 11 60	446 01	124	
25	10 133 23 37		215 11 60	448 05	125	
25	20 134 00 38		216 11 60	450 10	125	
25	30 134 38 38		217 11 61	452 15	126	
25	40 135 16 38		218 12 61	454 21	127	
26	50 135 54 38		219 13 61	456 28	129	
26	67 00 136 32 38		220 14 62	458 37	129	
26	10 137 10 39		221 13 62	460 46	130	
26	20 137 49 39		222 16 63	462 56	131	
26	30 138 28 39		223 21 63	464 07	132	
26	40 139 07 39		224 24 64	467 19	133	
27	50 139 46 40		225 28 64	469 32	134	
27	68 00 140 26 40		226 32 65	471 46	135	
27	10 141 06 41		227 37 65	474 01	136	
27	20 141 47 41		228 42 66	476 17	136	
27	30 142 28 41		229 48 66	478 33	138	
28	40 143 09 41		230 54 67	480 51	138	
28	50 143 50 41		232 01 67	483 09	139	
28	69 00 144 21 42		233 08 68	485 28	141	
28	10 145 13 42		234 16 68	487 49	142	
28	20 145 55 43		235 24 68	490 13	143	
29	30 146 38 43		236 32 69	492 34	144	
29	40 147 21 43		237 41 70	494 58	145	
29	50 148 04 43		238 51 70	497 83	145	
29	70 00 148 47 44		240 01 11	499 80	148	

The second Table of Rums.

Latt.	First	Second	Third	Fourth				
gr. m.	Long.	dif.	Long.	dif.	Long.	dif.	Long.	dif.
70 10 19	53 6	41	23 12	66	45 19	99	54 30	
20 19	59 6	41	35 13	67	05 20	100	24 30	
30 20	04 6	41	48 12	67	25 20	100	54 30	
40 20	10 6	42	00 13	67	45 20	101	24 30	
50 20	16 6	42	13 12	68	05 21	101	54 31	
71 00 20	22 6	42	25 13	68	26 20	102	25 31	
10 20	38 6	42	48 13	68	46 21	102	56 31	
20 20	34 7	42	51 13	69	07 21	103	27 31	
30 20	41 6	43	04 13	69	28 21	103	58 32	
40 20	47 6	43	17 13	69	49 21	104	30 32	
50 20	53 7	43	30 14	70	10 22	105	02 32	
72 00 21	00 6	43	44 13	70	32 22	105	34 32	
10 21	06 6	43	57 13	70	54 22	106	06 33	
20 21	12 7	44	10 14	71	16 22	106	39 33	
30 21	19 7	44	24 14	71	38 22	107	12 34	
40 21	26 7	44	38 14	72	00 33	107	46 34	
50 21	33 7	44	52 14	72	23 23	108	20 34	
73 00 21	40 6	45	06 14	72	46 23	108	54 34	
10 21	43 7	45	30 14	73	09 23	109	28 34	
20 21	53 7	45	34 15	73	32 23	110	03 35	
30 22	00 7	45	49 15	73	55 24	110	38 35	
40 22	07 7	46	04 15	74	19 24	111	13 36	
50 22	14 7	46	19 15	74	43 24	111	49 36	
74 00 22	21 8	46	34 15	75	07 25	112	25 36	
10 22	29 7	46	49 15	75	32 24	113	01 37	
20 22	36 8	47	04 16	75	56 25	113	38 38	
30 22	44 7	47	20 15	76	21 25	114	15 38	
40 22	51 8	47	35 16	76	46 25	114	53 38	
50 22	59 7	47	51 16	78	11 26	115	31 38	
75 00 23	06 8	48	07 16	78	27 26	116	09 28	

to find the difference of Longitudes

Lant.	Fift	Sixt	Seventh			
gr. m.	Long.	Adif.	Long.	dif.	Long.	dif.
70	10 149 31 44		241 12 72	502 17 149		
	20 150 15 55		242 24 72	504 46 150		
	30 151 00 45		243 36 73	507 16 151		
	40 152 45 46		244 49 73	509 47 152		
	50 153 31 46		246 02 74	512 19 154		
71	00 153 17 46		247 16 74	514 52 155		
	10 154 03 46		248 30 75	517 28 156		
	20 154 49 47		249 45 76	520 04 158		
	30 155 36 48		251 01 76	523 42 159		
	40 156 24 48		252 17 77	525 21 161		
	50 157 12 48		253 34 78	528 02 162		
72	00 158 00 49		254 52 78	530 44 163		
	10 158 49 49		256 10 79	533 27 165		
	20 159 38 49		257 29 80	536 12 166		
	30 160 27 50		258 49 81	538 58 168		
	40 161 17 50		260 10 82	541 46 170		
	50 162 07 51		261 32 82	544 36 171		
73	00 162 58 51		262 54 83	547 27 173		
	10 163 49 52		264 17 84	550 20 174		
	20 164 41 53		265 41 84	553 14 176		
	30 165 34 53		267 05 85	556 10 178		
	40 166 27 54		268 35 85	559 08 180		
	50 167 21 54		269 56 87	562 08 181		
74	00 168 15 55		271 23 88	565 09 183		
	10 169 10 55		272 51 89	568 12 185		
	20 169 55 55		274 20 90	571 17 187		
	30 171 00 56		275 50 91	574 24 189		
	40 171 56 57		277 21 92	577 33 191		
	50 172 53 57		278 53 93	580 44 194		
75	00 173 59 58		280 26 94	583 58 196		

Suns declination 1665, 1669, 1673, 1677.

Days.	Janua		Febru		Mar		April		May		June	
	South	South	South	South	North							
1	22	43	13	44	3	31	8	39	18	8	22	13
2	21	33	13	24	2	57	9	118	23	23	17	
3	21	23	13	4	2	34	9	2318	37	23	20	
4	21	12	12	43	2	10	9	4418	52	23	23	
5	20	11	12	22	1	46	15	619	06	23	26	
6	10	49	12	1	1	23	10	2719	20	23	28	
7	20	37	11	40	0	59	10	4319	33	23	39	
8	20	24	11	19	0	3511		919	46	23	31	
9	19	11	10	57	0	N	1211	3019	59	23	31	
10	19	58	10	36	0	12	11	5020	12	23	32	
11	18	45	10	14	0	35	12	1020	24	23	32	
12	19	31	9	53	1	0	12	3020	36	23	31	
13	19	16	9	30	1	23	12	5020	47	23	31	
14	19	1	9	7	1	47	13	920	58	23	30	
15	18	46	8	45	2	10	13	2921	923	28		
16	18	31	8	22	2	34	13	4921	19	23	26	
17	18	15	8	0	2	57	14	821	29	23	25	
18	17	59	7	37	3	21	14	2621	39	23	21	
19	17	43	7	14	3	44	14	4521	48	23	17	
20	17	26	6	51	4	7	15	321	57	23	14	
21	17	10	6	28	4	30	15	2122	523	10		
22	16	52	6	5	4	54	15	3922	13	23	5	
23	16	35	5	42	5	17	15	5722	21	23	0	
24	16	17	5	18	5	40	16	1422	28	22	55	
25	15	50	4	55	6	3	16	3122	35	22	49	
26	15	40	4	32	6	25	16	4822	42	22	43	
27	15	22	4	8	6	48	17	522	48	22	37	
28	15	03	3	45	7	11	17	3123	54	22	30	
29	16	43	-	-	7	33	17	3722	59	22	23	
30	16	34	-	-	7	55	17	5223	422		15	
31	16	4	-	-	8	17	-	23	9	-	-	

Suns declination 1665, 1669, 1673, 1677.

Days	July.			Augu.			Septē.			Octob.			Novē.			Decem		
	North	North	North	South	South	South	South	South	South	South	South	South	South	South	South	South	South	
1	22	07	15	10	4	23	7	17	17	42	23	1	10					
2	21	59	14	52	3	58	7	40	17	58	23	4	14					
3	21	50	14	34	3	36	8	3	18	14	23	1	18					
4	21	41	14	15	3	12	8	25	18	30	23	1	21					
5	21	32	13	56	2	49	8	48	18	45	23	1	24					
6	21	33	13	37	2	26	9	10	19	0	23	0	27					
7	21	11	13	18	2	2	9	32	19	15	23	0	29					
8	21	01	12	59	1	39	9	54	19	29	23	0	30					
9	20	50	12	39	1	16	10	16	19	43	23	0	31					
10	20	39	12	19	0	52	10	37	19	57	23	0	32					
11	20	27	11	59	0	29	10	59	20	10	23	0	32					
12	20	15	11	39	0	5	11	20	20	23	23	0	32					
13	20	3	11	39	0	18	11	41	20	35	23	0	31					
14	19	56	10	58	0	42	12	28	0	48	23	0	29					
15	19	37	10	37	1	5	12	23	30	59	23	0	28					
16	19	24	10	16	1	29	12	44	21	10	23	0	26					
17	19	10	9	55	1	53	13	42	1	21	23	0	23					
18	18	56	9	34	2	16	13	24	21	32	23	0	19					
19	18	42	9	12	2	39	13	44	21	42	23	0	16					
20	18	27	8	51	3	3	14	42	21	52	23	0	11					
21	18	12	8	29	3	26	14	24	22	12	23	0	7					
22	17	57	8	7	3	49	14	43	22	10	23	0	2					
23	17	42	7	45	4	13	15	22	22	18	22	0	36					
24	17	26	7	23	4	30	15	21	22	26	22	0	50					
25	17	10	7	1	4	39	15	40	22	34	22	0	44					
26	16	54	6	38	5	23	13	58	22	41	22	0	37					
27	16	37	6	18	5	46	16	16	22	47	22	0	30					
28	16	20	5	53	6	9	16	34	22	54	22	0	22					
29	16	3	5	30	6	32	16	51	22	59	22	0	13					
30	15	46	5	8	6	54	17	8	23	52	22	0	5					
31	15	38	4	45		47	25			21	56							

Suns declination 1666, 1670, 1674, 1678.

	Janua	Februa.	Mar.	April	May	June
	South	South	South	North	North	North
1	21 46	13 49	03 27	08 34	18 04	23 12
2	21 36	13 29	03 20	08 55	18 19	23 16
3	21 26	13 9	02 40	09 17	18 34	23 19
4	21 15	12 48	02 16	09 39	18 49	23 22
5	21 4	12 27	01 52	10 19	19 03	23 25
6	20 52	12 6	01 29	10 32	19 17	23 27
7	20 40	11 45	01 31	10 43	19 30	23 29
8	20 27	11 24	00 41	11 4	19 43	23 30
9	20 14	11 2	00 18	11 25	19 56	23 31
10	20 1	10 41	00 6	11 45	20 09	23 32
11	19 48	10 19	00 30	12 05	20 21	23 32
12	19 34	09 57	00 54	12 26	20 33	23 32
13	19 19	09 35	01 18	12 46	20 44	23 31
14	19 5	09 13	01 41	13 05	20 56	23 30
15	18 50	08 51	02 51	13 25	21 7	23 28
16	18 35	08 28	02 29	13 44	21 17	23 27
17	18 19	08 6	03 52	14 03	21 27	23 25
18	18 3	07 30	03 16	14 22	21 37	23 22
19	17 47	07 20	03 39	14 41	21 46	23 18
20	17 30	06 57	04 14	14 59	21 55	23 15
21	17 14	06 34	04 25	15 17	22 03	23 11
22	16 56	06 11	04 48	15 35	22 11	23 06
23	16 39	05 48	05 11	15 53	22 19	23 01
24	16 21	05 24	05 34	16 10	22 27	22 56
25	16 7	05 1	05 57	16 27	23 34	22 50
26	15 44	04 38	06 19	16 44	22 40	22 44
27	15 26	04 14	06 42	17 01	22 46	22 38
28	15 7	03 51	07 17	17 17	22 52	22 31
29	14 48		07 27	17 33	22 58	22 24
30	14 3		07 49	17 49	23 03	22 17
31	14 9		08 11	23	08	22 3

Suns declination 1666, 1670, 1674, 1678.

Day	July.	Augn.	Septē.	Octob.	Novē.	Decem
8	North	North	North	South	South	South
1	22	09	15	13	4	27
2	22	01	14	16	4	3
3	21	52	14	38	3	41
4	21	43	14	19	3	17
5	21	34	14	01	2	55
6	21	24	13	42	2	33
7	21	14	13	23	2	8
8	21	04	13	3	1	45
9	20	53	12	43	1	22
10	20	42	12	23	0	58
11	20	30	12	13	0	35
12	20	18	11	43	0	11
13	20	6	11	23	0	13
14	19	53	11	03	0	36
15	19	40	10	42	1	01
16	19	27	10	21	1	23
17	19	14	10	0	1	47
18	19	10	9	39	2	10
19	18	49	9	17	2	34
20	18	31	8	56	2	57
21	18	16	8	34	3	21
22	18	1	8	12	3	34
23	17	46	7	50	4	14
24	17	30	7	28	4	31
25	17	14	7	16	4	54
26	16	58	6	43	5	17
27	16	41	6	21	5	40
28	16	34	5	58	6	41
29	16	7	5	35	6	27
30	15	50	5	13	6	49
31	15	32	4	50		17
					21	
						8

Suns declination 1667, 1673, 1675, 1679.

	Jan.	Febr.	Mar.	April	May	June
	South	South	South	North	North	North
1 21 248	13 154	037	33 08	29 18	0 23	11
2 21 38	13 134	037	908	51 18	19 23	15
3 21 28	13 13	027	4909	12 18	30 23	18
4 21 48	12 8	033	028	21 09	34 18	45 23
5 21 7	12 8	033	018	59 19	56 18	39 23
6 20 55	12 8	12 018	34 10	17 19	13 23	27
7 20 43	11 05	018	10 10	38 19	27 23	29
8 20 31	11 03	000	47 10	59 19	40 23	30
9 20 18	11 03	000	23 111	20 19	53 23	31
10 20 5 10	0 46	000N	01 110	40 20	6 23	32
11 19 51	10 03	000	24 12	00 20	18 23	33
12 19 39	10 03	000	148	21 20	30 23	33
13 19 23	09 04	01	112	12 2	41 20	41 23
14 19 9 09	09 01	134	13 0	20 20	53 23	30
15 18 54	08 05	018	59 13	20 21	04 23	28
16 18 39	08 033	02	12 3	13 21	14 23	27
17 18 23	08 151	02	146	13 2	58 21	24 23
18 18 7 07	14	03	110 14	17 21	34 23	23
19 17 51	07 125	03	133 14	36 21	44 23	19
20 17 35	07 12	03	256 14	55 21	53 23	15
21 17 18	06 14	04	119 15	13 22	1 23	13
22 17 10	06 13	04	143 15	31 22	9 23	07
23 16 43	05 153	05	106 15	49 22	17 23	19
24 16 32	05 153	05	129 16	06 22	22 25	58
25 16 17	05 15	05	152 16	29 22	32 22	52
26 15 49	04 43	06	14 16	40 22	39 22	46
27 15 31	04 23	06	37 16	57 22	45 22	40
28 15 18	03 256	07	00 17	13 22	51 22	33
29 14 53	2	107	022 17	29 22	57 22	26
30 14 33	2	07	144 17	45 23	02 22	19
31 14 14	1	08	06	23 07	1	13

Suns declination 1667, 1671, 1675, 1679.

	July.	Aug.	Sept.	Octob.	Novē.	Decens
	North	North	North	South	South	South
11	22	11	15	16	4	33
15	22	03	15	01	4	10
18	31	54	14	43	3	47
31	42	45	14	24	3	23
34	52	36	14	06	3	00
27	62	26	13	47	2	37
29	72	16	13	27	2	14
30	82	06	13	07	1	50
31	920	55	12	48	1	27
32	1020	44	12	29	1	03
34	1120	33	12	09	0	40
35	1220	21	11	49	0	17
31	1320	09	11	28	0	S 07
30	1419	56	11	08	0	30
28	1519	43	10	47	0	14
27	1619	30	10	26	1	17
25	1719	17	10	05	1	41
23	1819	03	9	44	2	04
19	1918	49	9	23	2	28
21	2018	34	9	1	2	51
22	2118	20	8	39	3	15
07	2218	05	8	17	3	38
03	2317	49	7	55	4	02
58	2417	34	7	33	4	25
52	2517	18	7	11	4	48
46	2617	02	6	49	5	11
49	2716	45	6	36	5	34
33	2816	29	6	04	5	58
26	2916	11	5	41	6	21
19	3015	54	5	18	6	44
31	15	37	4	55	17	17

Suns declination 1664, 1668, 1672, 1676.

Date	Janua.		Februa.		Mar.		April		May		June	
	South	South	South	South	North							
1 21	51 13	59 03	13 08	45 18	18	12	23	34				
2 21	41 13	39 02	51 09	7 18	27	23	18					
3 21	31 13	19 02	27 09	29 18	42	23	21					
4 21	20 12	58 02	47 09	50 18	56	23	24					
5 21	9 12	38 01	40 10	11 19	10 23		26					
6 20	58 12	37 01	16 10	33 19	23	23	28					
7 20	46 11	56 00	52 10	54 19	37	23	30					
8 20	34 11	34 00	29 11	35 19	50	23	31					
9 20	21 11	43 00	05 11	85 20	3	23	32					
10 20	8 10	51 00 N	10 11	55 20	45	23	32					
11 19	55 10	30 00	43 12	16 20	27	23	33					
12 19	41 10	8 01	06 12	36 20	39	23	31					
13 19	27 09	46 01	30 12	56 20	50	23	30					
14 19	13 09	24 01	53 13	15 21	1	23	29					
15 18	58 09	0 1 02	17 13	35 21	11	23	27					
16 18	43 08	39 02	41 13	54 21	22	23	25					
17 18	28 08	17 03	04 14	11 21	32	23	23					
18 18	17 07	54 03	27 14	32 21	41	23	20					
19 17	55 07	31 03	51 14	50 21	50	23	16					
20 17	39 07	9 04	14 15	8 21	39	23	13					
21 17	23 06	45 04	37 15	36 22	8	23	9					
22 17	5 06	22 05	00 15	44 22	21	16	23					
23 16	47 05	59 05	23 16	2 22	23	22	59					
24 16	30 05	35 05	46 16	19 22	30	22	43					
25 16	12 05	12 06	09 16	36 22	37	22	48					
26 15	53 04	49 06	31 16	53 22	44	22	43					
27 15	35 04	25 06	54 17	9 22	50	22	35					
28 15	16 04	2 07	17 17	25 22	55	22	28					
29 14	57 03	38 07	39 17	41 23	0	22	21					
30 14	38	08	11 17	57 23	52	22	13					
31 14	19	08	83	23	10							

Suns declination 1664, 1668, 1672, 1676.

	July	Aug.	Sept.	Octob.	Novē	Decem	
	North	North	North	South	South	South	
1	21 05 15	06 04	15	7	23 17	46 23	10
2	21 56 14	47 03	52	7	46 18	03 23	15
3	21 48 14	29 03	29	8	09 18	18 23	19
4	21 38 14	10 03	06	8	31 18	34 23	22
5	21 29 13	51 02	42	8	54 18	49 23	25
6	21 19 13	32	2	19	9 16	04 23	27
7	21 08 13	12	1	56 9	38 19	19 23	29
8	20 58 12	53	1	32 10	00 19	33 23	30
9	20 47 12	32	1	09 10	22 19	47 23	31
10	20 35 12	14	0	46 10	43 20	00 13	32
11	20 24 11	53	0 S	22 11	03 20	3 23	32
12	20 12 11	33	0	01 11	26 20	26 23	31
13	19 59 11	12	0	25 11	47 20	39 23	30
14	19 47 10	52	0	48 12	03 20	51 23	29
15	19 33 10	31	1	12 12	29 21	02 23	27
16	19 20 10	10	1	36 12	49 21	13 23	25
17	19 06 9	49	1	59 13	09 21	24 23	21
18	18 52 9	28	2	22 13	30 21	35 23	18
19	18 38 9	06	2	46 13	50 21	45 23	15
20	18 22 8	04	3	9 14	10 21	54 23	10
21	18 08 8	03	3	32 14	39 22	3 23	05
22	17 53 8	01	3	56 14	48 22	12 23	00
23	17 37 7	39	4	19 15	07 22	20 22	54
24	17 22 7	17	4	42 15	26 22	28 22	48
25	17 05 6	54	5	06 15	44 21	36 22	42
26	16 49 6	32	5	29 16	03 22	43 22	35
27	16 32 6	05	5	52 16	21 22	49 22	27
28	16 16 5	47	6	15 16	3 22	55 22	19
29	15 58 5	24	6	38 16	56 23	01 22	11
30	15 41 5	01	7	01 17	13 23	06 22	02
31	15 23 4	38		17	30	21	52

Suns Right Ascension in Hours and Minutes.

D	Janua		Februa		Mar.		April.		May.		June.	
	H	M	H	M	H	M	H	M	H	M	H	M
1	19	33	21	41	23	37	1	20	3	13	5	18
2	19	37	21	45	23	31	1	23	3	17	5	22
3	19	41	21	49	23	34	1	27	3	21	5	26
4	19	45	21	53	23	38	1	31	3	24	5	30
5	19	50	21	57	23	42	1	34	3	28	5	34
6	19	54	22	00	23	45	1	38	3	32	5	38
7	19	58	22	04	23	49	1	42	3	36	5	42
8	20	03	22	08	23	52	1	45	3	40	5	46
9	20	07	22	15	23	56	1	49	3	44	5	51
10	20	11	22	16	00	00	1	53	3	48	5	55
11	20	15	22	20	0	03	1	57	3	52	5	59
12	20	20	22	24	0	07	2	00	3	56	6	0
13	20	24	22	27	0	11	2	04	4	00	6	0
14	20	28	22	31	0	14	2	08	4	04	6	1
15	20	32	22	35	0	18	2	11	4	08	6	1
16	20	36	22	39	0	21	2	15	4	12	6	2
17	20	40	22	42	0	25	2	19	4	16	6	2
18	20	45	22	46	0	29	2	23	4	20	6	3
19	20	49	22	50	0	32	2	27	4	24	6	3
20	20	53	22	54	0	36	2	30	4	28	6	3
21	20	57	22	57	0	40	2	34	4	33	6	4
22	21	01	23	01	0	43	2	38	4	37	6	4
23	21	05	23	05	0	47	2	42	4	41	6	4
24	21	09	23	08	0	50	2	46	4	45	6	5
25	21	13	23	12	0	54	2	49	4	49	6	5
26	21	17	23	16	0	58	2	53	4	53	7	
27	21	21	23	20	1	01	2	57	4	57	7	0
28	21	25	23	23	1	05	3	01	5	01	7	1
29	21	29			1	09	3	05	5	05	7	1
30	21	33			1	12	3	09	5.	10	7	1
31	22	73			1	16			5	14		

Sun's Right Ascension in Hours and Minutes.

Date	July			Augu			Sept.			Octob.			Nove.			Decem		
	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M	H	M
1	07	22	09	24	11	18	13	06	15	06	17	14						
2	07	26	09	28	11	21	13	10	15	10	17	19						
3	07	30	09	31	11	25	13	14	15	14	17	23						
4	07	34	09	35	11	29	13	17	15	18	17	27						
5	07	38	09	39	11	32	13	21	15	23	17	32						
6	07	42	09	43	11	36	13	25	15	27	17	36						
7	07	46	09	46	11	39	13	29	15	32	17	41						
8	07	50	09	50	11	43	13	32	15	35	17	45						
9	07	54	09	54	11	47	13	36	15	39	17	50						
10	07	58	09	58	11	50	13	40	15	43	17	54						
11	08	02	10	03	11	54	13	44	15	48	17	59						
12	08	06	10	05	11	57	13	48	15	52	18	03						
13	08	10	10	09	12	01	13	51	15	56	18	07						
14	08	14	10	12	12	04	13	55	16	00	18	12						
15	08	18	10	16	12	08	13	59	16	05	18	16						
16	08	22	10	20	12	12	14	03	16	09	18	21						
17	08	26	10	23	12	15	14	07	16	13	18	25						
18	08	30	10	27	12	19	14	11	16	17	18	30						
19	08	34	10	31	12	23	14	14	16	22	18	34						
20	08	38	10	34	12	26	14	18	16	26	18	09						
21	08	42	10	38	12	30	14	22	16	30	18	43						
22	08	46	10	42	12	33	14	36	16	35	18	48						
23	08	49	10	45	12	37	14	30	16	39	18	52						
24	08	53	10	49	12	43	14	34	16	43	18	56						
25	08	57	10	53	12	44	14	38	16	48	19	01						
26	09	01	10	56	12	48	14	42	16	52	19	05						
27	09	05	11	00	12	52	14	46	16	56	19	10						
28	09	09	11	03	12	55	14	50	17	01	19	14						
29	09	13	11	07	12	59	14	54	17	05	19	18						
30	09	16	11	11	13	03	14	58	17	10	19	23						
31	09	20	11	14				15	03	19	27							

The Declination and right Ascension of the Stars
calculated for 20 years yet to come.

NAME S.	Right Ascension.			Declination.	distance frō po D. M.
	H.	M.	D.		
Bulls eye	4	10	15	48	N 74
Arcturus	14	01	20	58	N 69
Lyra	18	25	38	30	N 51
Medusa's head <i>Algol</i>	2	47	39	39	N 50
The Goat <i>Capella</i>	4	52	45	37	N 44
Lions heart <i>Regnulus</i>	9	39	13	33	N 76
Lions tale	11	32	16	25	N 73
Virgins Spike	13	04	9	31	S 80
Scorpions heart	16	09	25	37	S 64
Fomahant	22	39	37	17	S 52
Left foot of Orion	04	59	08	37	S 81
1 in Orions Girdle	05	03	0	35	S 89
2 in Orions Girdle	05	19	01	26	S 88
3 in Orions Girdle	05	24	02	09	S 87
Great dog <i>Sirius</i>	06	31	16	14	S 73
Little dog <i>Procyon</i>	07	22	06	03	N 83
Hydra's heart	09	18	07	15	S 82
Breast of <i>Cassiopea</i>	00	22	54	45	N 35
Girdle of <i>Andromeda</i>	00	51	33	55	N 56
Whales belly	01	35	11	54	S 78
Hydra's head	08	21	4	30	N 85
Pegasus mouth	21	28	8	24	N 81
Pegasus shoulder	23	59	13	22	N 76
Head of <i>Andromeda</i>	23	39	27	18	N 62
Perseus right side	09	57	48	36	N 41
In the Whales Chap	02	45	2	48	N 87
					Whal

1. Tales tale	00	27	19	48	S	70	12
2. Sons left shoulder	05	4	6	1	N	83	59
3. forefoot of great dog	06	08	17	49	S	72	15
4. C-star	00	31	87	33	N	2	27
5. uppermost in the	14	39	75	36	N	14	24
6. square of the little Bear.							
7. in great Bears tale	12	39	75	47	N	14	13
8. right star of the Crown	15	20	27	51	N	62	9
9. Hercules left knee	17	44	37	21	N	52	39
10. Mans tail	20	28	44	05	N	45	55
11. Spentinus head	17	20	12	52	N	77	8
12. right foot of the twins	06	18	16	38	N	73	22
13. Sons neck	10	01	21	29	N	68	31
14. South ballance	14	32	14	37	S	75	23
15. North ballance	15	0	08	07	S	81	53

Questions of Navigation.

Question 1. By the rumb and distance of two places, to find the difference of latitude.

1. the Radius is

2. the sine of the compl. of the rumb from the merid.

3. is the distance

4. the difference of Latitude.

5. Examp. If a ship sail West North-west (that is up the sixth rumb from the merid.) the distance 90 leagues : what shall be the difference of latitude ?

6. First, I see in the Table foregoing that the angle which that rumb maketh with the meridian is 67 deg. 30 min. the complement whereof is 22 deg. 30 m. whose sine is 38268. Therefore

7. 100000 is to 38268

8. So is 90 to 34° 4' leagues to the difference of latitude, which

A Table of Amplitudes for these deg. of Latitudes.

Degrees of Declination.	Amplitude								Degrees of Declination.	
	30°	32°	34°	36°	38°	40°	42°	44°		
signs	D.	M.	D.	M.	D.	M.	D.	M.	D.	M.
0	0	00	0	00	0	00	0	00	0	00
1	1	9	1	10	1	12	1	14	1	16
2	2	18	2	21	2	25	2	29	2	32
3	3	28	3	33	3	38	3	44	3	49
4	4	37	4	44	4	50	4	58	5	03
5	5	46	5	54	6	3	6	11	6	21
6	6	56	7	3	7	14	7	25	7	37
7	8	6	8	16	8	27	8	40	8	54
8	9	15	9	27	9	39	9	54	10	10
9	10	24	10	39	10	52	11	00	11	27
10	11	34	11	48	12	5	12	24	12	43
11	12	44	13	00	13	18	13	39	14	00
12	13	53	14	11	14	32	14	54	15	18
13	15	3	15	23	15	45	16	9	16	35
14	16	12	16	35	16	59	17	24	17	52
15	17	22	17	46	18	12	18	40	19	10
16	18	32	18	58	19	16	19	55	20	28
17	19	43	20	10	20	39	21	11	21	47
18	20	54	21	22	21	53	22	27	23	23
19	22	5	23	25	23	7	23	44	24	24
20	23	16	23	47	24	22	25	00	25	43
21	24	25	25	00	25	37	26	17	27	3
22	25	38	26	13	26	52	27	35	28	23
23	26	49	27	26	28	7	28	53	29	44
23	31	27	25	28	28	45	29	32	30	31

the East, and set 31 Degrees 10 Minutes to the Northward of the West: But if the Declination had been 1 Degree South, then they would have risen 31 Degrees 10 Minutes to the Southward of the East, and set 3 Degrees 10 Minutes to the Southward of the West.

Look for

Latitude

angle of

In the

00 min.

Answer

at Sun-risi

the declin

Look

above said

A Table of Amplitudes for these deg. of Latitudes.

Degrees of Declination.	45		46		47		48		49		50		51		52	
	D.	M.														
0	0	00	0	00	0	00	0	00	0	00	0	00	0	00	0	00
1	1	25	1	26	1	28	1	29	1	31	1	33	1	35	1	37
2	2	50	2	53	2	56	2	59	3	3	3	6	3	10	3	15
3	4	15	4	16	4	24	4	29	4	34	4	40	4	46	4	52
4	5	40	5	45	5	52	5	59	6	6	6	14	6	22	6	30
5	7	5	7	12	7	21	7	29	7	38	7	48	7	58	8	8
6	8	30	8	38	8	49	8	59	9	10	9	22	9	34	9	46
7	9	56	10	6	10	18	10	30	10	42	10	56	11	10	11	25
8	11	21	11	33	11	47	12	00	12	14	12	31	12	47	13	4
9	12	47	13	1	13	16	13	31	13	48	14	5	14	24	14	43
10	14	13	14	27	14	45	15	2	15	21	15	40	16	1	16	23
11	15	39	15	55	16	15	16	34	16	54	17	16	17	39	18	3
12	17	6	17	25	17	45	18	6	18	28	18	52	19	18	19	44
13	18	33	18	54	19	16	19	39	20	3	20	29	20	58	21	26
14	20	02	20	23	20	47	21	13	21	38	22	6	22	38	23	8
15	21	58	21	53	22	18	23	49	23	14	23	44	24	17	24	53
16	22	56	23	23	23	50	24	20	24	51	25	23	25	59	26	36
17	24	25	24	53	25	33	25	55	26	28	27	3	27	41	28	21
18	25	55	26	25	26	57	27	31	28	6	28	44	29	25	30	8
19	27	25	27	57	28	32	29	7	29	45	30	26	31	9	31	56
20	28	56	29	30	30	7	30	45	31	25	32	9	32	15	33	46
21	30	27	31	03	31	42	32	23	33	6	33	53	34	48	5	36
22	32	00	32	37	33	19	34	3	34	48	35	40	36	32	37	29
23	33	32	34	13	34	57	35	43	36	34	37	26	38	23	39	24
24	31	31	20	35	2	35	48	16	34	37	26	38	20	39	20	40

Look for your Latitude in the head of the Table, and the declination in the first Column on the left hand, and in the common angle of meeting, you will find Amplitude desired.

In the Latitude of 30 deg. the Sun's declination being 7 deg. 00 min. North, I demand the Amplitude.

Answer, The Amplitude is 8 d. 6 m. from the East Northward, at Sun-rising, or from the West Northward at Sun setting: But if the declination had been 7 d. 00 m. South, in Latitude 30 d. as above-said, then the Amplitude would have been 8 d. 6 m. from the

A Table of Amplitudes for these deg. of Latitudes

Degrees of Declination	Sun's Time	53		54		55		56		57		58		59		60	
		D.	M.														
0	0 00	0	00	0	00	0	00	0	00	0	00	0	00	0	00	0	00
1	1 39	1	42	1	45	1	47	1	50	1	53	1	56	2	0		
2	3 20	3	24	3	29	3	34	3	40	3	46	3	53	4	0		
3	4 59	5	6	5	14	5	22	5	31	5	40	5	50	6	0		
4	6 39	6	49	6	59	7	10	7	22	7	34	7	47	8	1		
5	8 19	8	32	8	45	8	58	9	14	9	28	9	43	10	2		
6	10 0	10	15	10	30	10	47	11	4	11	23	11	43	12	4		
7	11 41	11	58	12	16	12	35	12	56	13	18	13	41	14	6		
8	13 22	13	44	14	2	14	24	14	48	15	14	15	41	16	1		
9	15 4	15	26	16	48	16	15	16	42	17	10	17	41	18	1		
10	16 46	17	11	17	37	18	6	18	36	19	8	19	42	20	1		
11	18 29	18	57	19	26	19	57	20	31	21	6	21	49	22	2		
12	20 13	20	43	21	15	21	50	22	26	23	6	23	49	24	3		
13	21 57	22	30	23	5	23	43	24	23	25	7	25	59	26	4		
14	23 42	24	18	24	57	25	38	26	32	27	10	28	1	28	5		
15	25 28	26	7	26	49	27	34	28	22	29	14	30	10	31	1		
16	27 16 27	28	43	29	32	30	24	31	21	32	22	33	2				
17	29 4	29	50	30	39	31	31	32	28	33	29	34	35	35	4		
18	30 54 31	44	32	36	33	33	34	34	35	40	36	52	38	1			
19	32 45 33	38	34	35	35	36	36	43	37	54	39	43	40	3			
20	34 39 35	35	36	36	37	42	38	53	40	12	41	37	43	1			
21	36 33 37	33	38	40	39	51	41	9	42	34	44	40	45	4			
22	38 31 39	37	40	46	42	4	43	27	44	59	46	40	48	3			
23	40 29 41	40	42	56	44	20	48	50	47	30	49	21	51	2			
24	41 29 42	43	44	2	45	20	47	02	48	49	50	44	52	5			

the East Southward at Sun rising, and 3 d. 6 m. from the West Southward at Sun-setting; for if the declination be North, the true Amplitude will always be to the Northwards of the East or West: But if the declination be South, the true Amplitude will always be to the Southwards of the East or West.

If you have any odd minutes of declination, you must take the proportional part.

In the Latitude of 42 d. 30 m. the Sun's declination being 12 15 m. I demand the Amplitude.

Answe^r, The Amplitude is 16 deg. 43 min.

